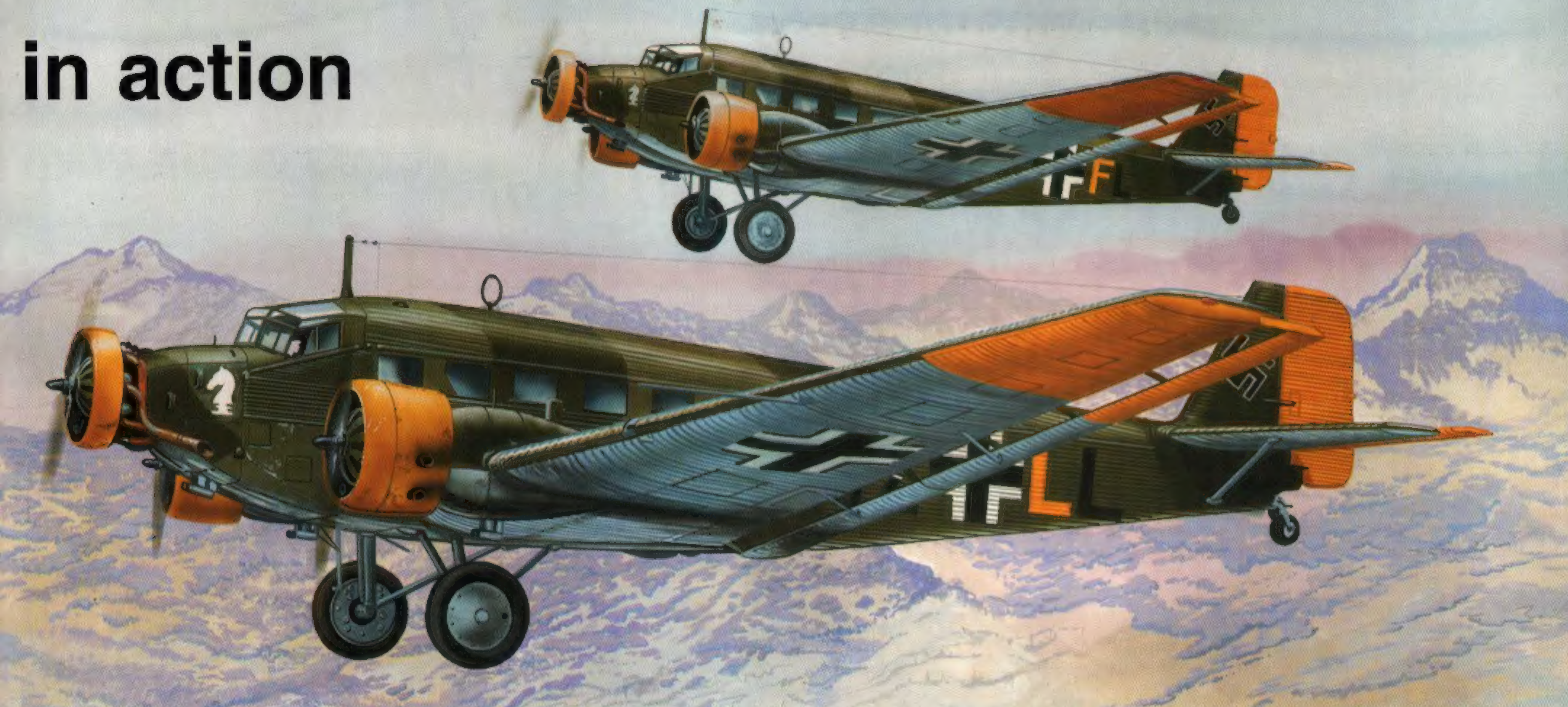


# Junkers Ju 52

in action



**Aircraft Number 186**  
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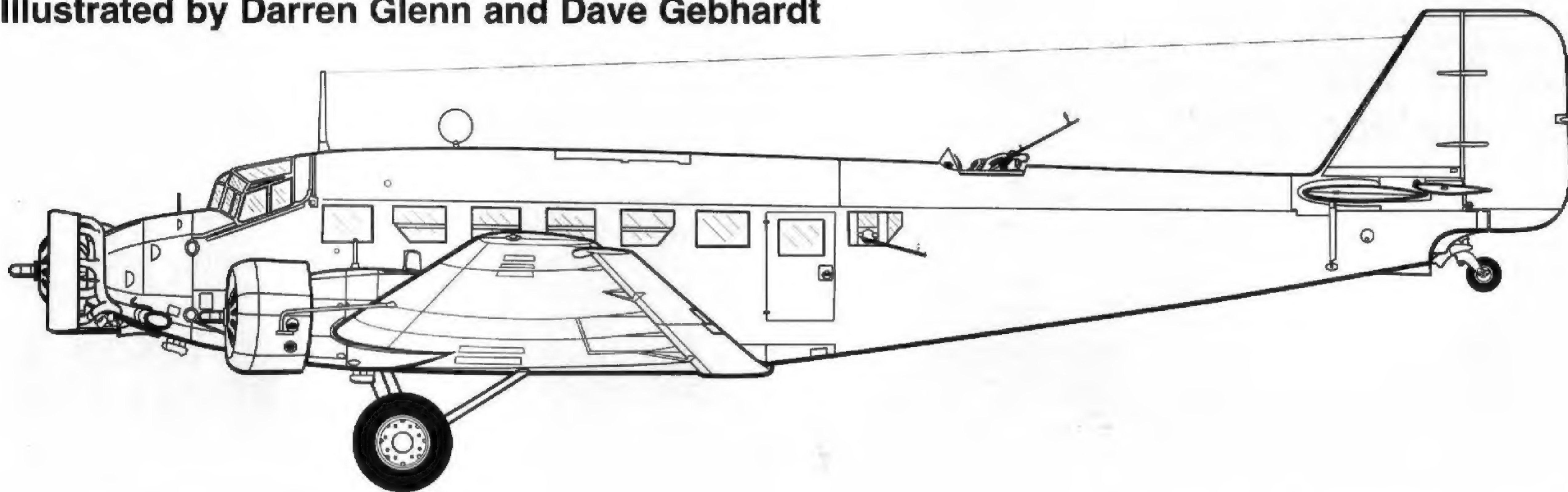
# **Junkers Ju 52**

## **in action**

**By Hans-Heiri Stapfer, Hans-Joachim Mau, and George Punka**

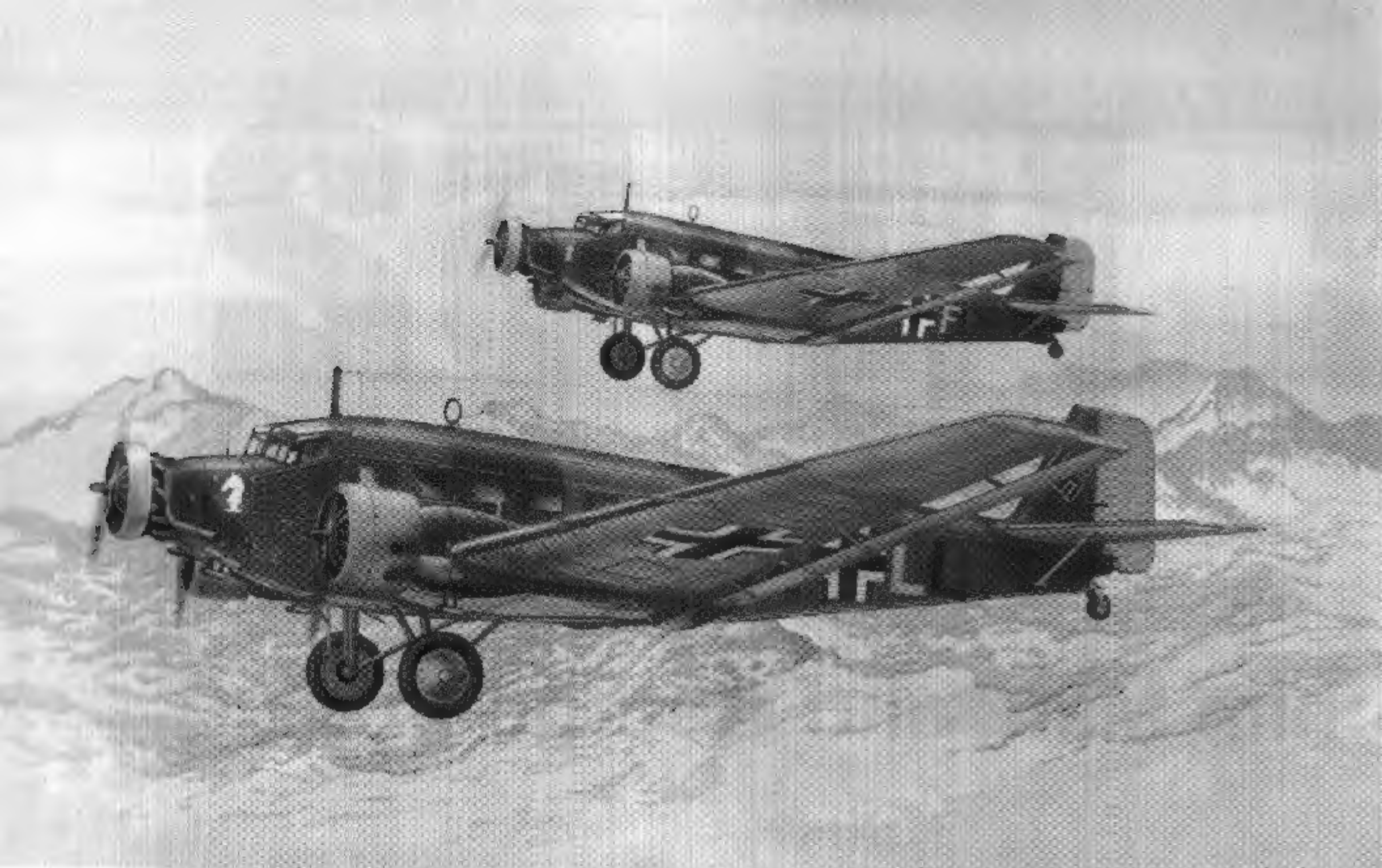
**Color by Don Greer**

**Illustrated by Darren Glenn and Dave Gebhardt**



**Aircraft Number 186**  
**squadron/signal publications**





Two Ju 52/3m g7es (1Z+LL and 1Z+FL) fly from Milos, Greece to Crete on 20 May 1941. Both aircraft were assigned to 3. *Staffel* (Squadron), *Kampfgeschwader zur besonderen Verwendung* (Bomber Wing for Special Duties) 1, a Luftwaffe transport unit. The Ju 52/3ms airlifted German paratroopers for *Unternehmung MERKUR* (Operation MERCURY), the invasion of Crete.

## Acknowledgements

Our thanks go to a number of people and fellow aviation aircraft enthusiasts that helped us to compile this particular "in action." Without their assistance the Ju-52 book would never have been completed. We owe all of them a sincere "*Danke schön*" (Thank you).

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A winter camouflaged Junkers Ju 52/3m g5e flies low over a snow-covered Soviet forest during World War Two. This particular aircraft is equipped with a large loop-shaped Direction Finding (DF) antenna on the upper fuselage. Most Ju 52/3m g5es were fitted with small loop-shaped DF antennas. Despite its obsolescence, the Ju 52/3m was a durable and reliable aircraft in Luftwaffe service. The Germans nicknamed it '*Tante Ju*' (Aunt Ju), while the Allies called it '*Iron Annie*.' (Bundesarchiv)







# Introduction

The Junkers Ju 52/3m (*drei Motoren*; three engine) culminated a series of all-metal monoplane aircraft developed by Junkers *Flugzeug- und Motorenwerke A.G.*<sup>1</sup> since 1915. This series began with the J 1 fighter, which was the world's first all-metal aircraft. The J 1 led, through several other designs, to the J 9 single-seat fighter and the J 10 two-seat attack fighter. Both the J 9 and J 10 saw brief action in the last year of World War One.

The conflict's end on 11 November 1918 led Junkers – based at Dessau in central Germany's Sachsen-Anhalt region – to enter civil aircraft design and production. Their first such aircraft was the F 13, a single-engine monoplane transport carrying two pilots and four passengers. On 25 June 1919, the F 13 prototype first flew and the 322 aircraft built by 1932 saw worldwide service. The first Junkers tri-motor was the G 23 of 1924, which was further developed into the G 24 one year later. In 1926, further development led to the F 24, W 33, and W 34 single-engine and G 31 three-engine transports.

In 1930, Junkers engineers began development of a cargo transport to replace the W 33 and G 31. This new aircraft was intended to combine a sturdy structure, a high degree of reliability, and low operating costs. The designers envisioned a single-engine monoplane of all-metal construction, including a corrugated duralumin skin carried over from previous Junkers designs. Pressing sheet metal produced this skinning, which could be cut to size and shape using shears. This simple yet strong structure was easy to repair, weather resistant, and easily adapted to various sized aircraft.

<sup>1</sup>*Flugzeug- und Motorenwerke A.G. (Aktiengesellschaft); Aircraft and Engine Factory Joint Stock Company*

The Junkers Ju 52 be prototype (D-1974, *Werk Nr. 4001*) was publicly introduced at Berlin-Tempelhof airfield on 17 February 1931. This aircraft was powered by one 685 HP BMW VIIaU inline engine. Its only marking was the German civil registration painted on the fuse-

Gotthard Sachsenberg, one of Junkers' managers, laid down the first parameters for the new aircraft, which was designated the Ju 52. He envisioned a transport capable of carrying a two MT (2.2 ton) payload 800 km (497.1 miles). The maximum designed speed was 120 kmh (74.6 MPH), since speed was less important for cargo aircraft than for airliners. Sachsenberg calculated that the Ju 52's low operating costs would prevent airfreight companies from asking for government subsidies, which was common during the 1920s.

*Dipl.-Ing.*<sup>2</sup> Ernst Zindel took charge of designing and engineering the Ju 52. This new design was based on the earlier W33, but with larger dimensions. The Ju 52 prototype's wing span of 29 m (95 feet 1.7 inches) was 11 m (36 feet 1.2 inches) greater than for the W33. This new aircraft was 18.4 m (60 feet 4.4 inches) long and 6.1 m (20 feet 0.1 inches) high. The W33's length and height were 10.5 m (34 feet 5.4 inches) and 3.5 m (11 feet 5.8 inches), respectively.

The Ju 52 was a low wing cantilever monoplane whose wing structure incorporated four tubular steel spars for strength. This aircraft featured the 'double wing' frequently used on Junkers aircraft and mounted aft and below the trailing edge. This 'wing' occupied the full wing span and included flaps on the inner section and ailerons on the outer section. The 'double wing' allowed for low-speed take offs and landings from the small and unprepared airfields from which this Junkers aircraft was designed to operate.

Large cargo access doors were fitted to the Ju 52's upper and side fuselage, which allowed for loading and unloading bulky items using a crane. The main cargo hold was 6.4 m (21 feet) long, 1.6 m (5 feet 3 inches) wide, and 1.9 m (6 feet 2.8 inches) high. These dimensions resulted in a cargo volume of 16.7 m<sup>3</sup> (589.8 cubic feet). The Ju 52 – like the earlier W33 – was equipped to use various types of undercarriage, depending on the operating area. It was fitted with single fixed wheels and a tailskid for land, skis for snow-covered fields, or twin floats for

<sup>2</sup>*Dipl.-Ing.; Diplom Ingenieur (Certified Engineer)*

lage. The window in the front access door behind the cockpit was originally circular in shape. (Lufthansa)



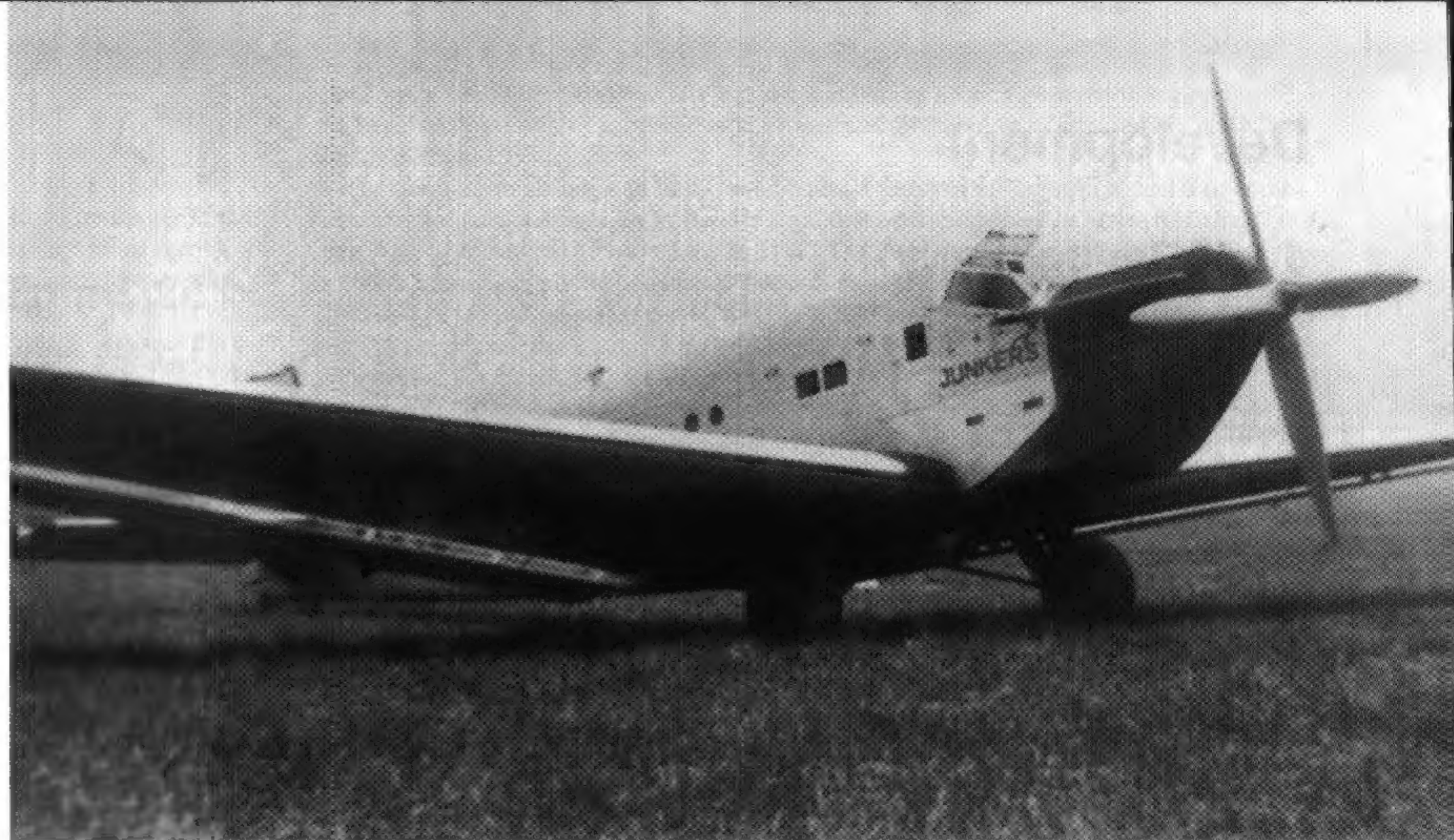


water operation. The crew consisted of a pilot and co-pilot and both cockpit stations were fitted with full controls. The Ju 52 was powered by an 800 HP Junkers L88 12-cylinder, liquid-cooled, inline engine, which turned a four-bladed fixed pitch metal propeller.

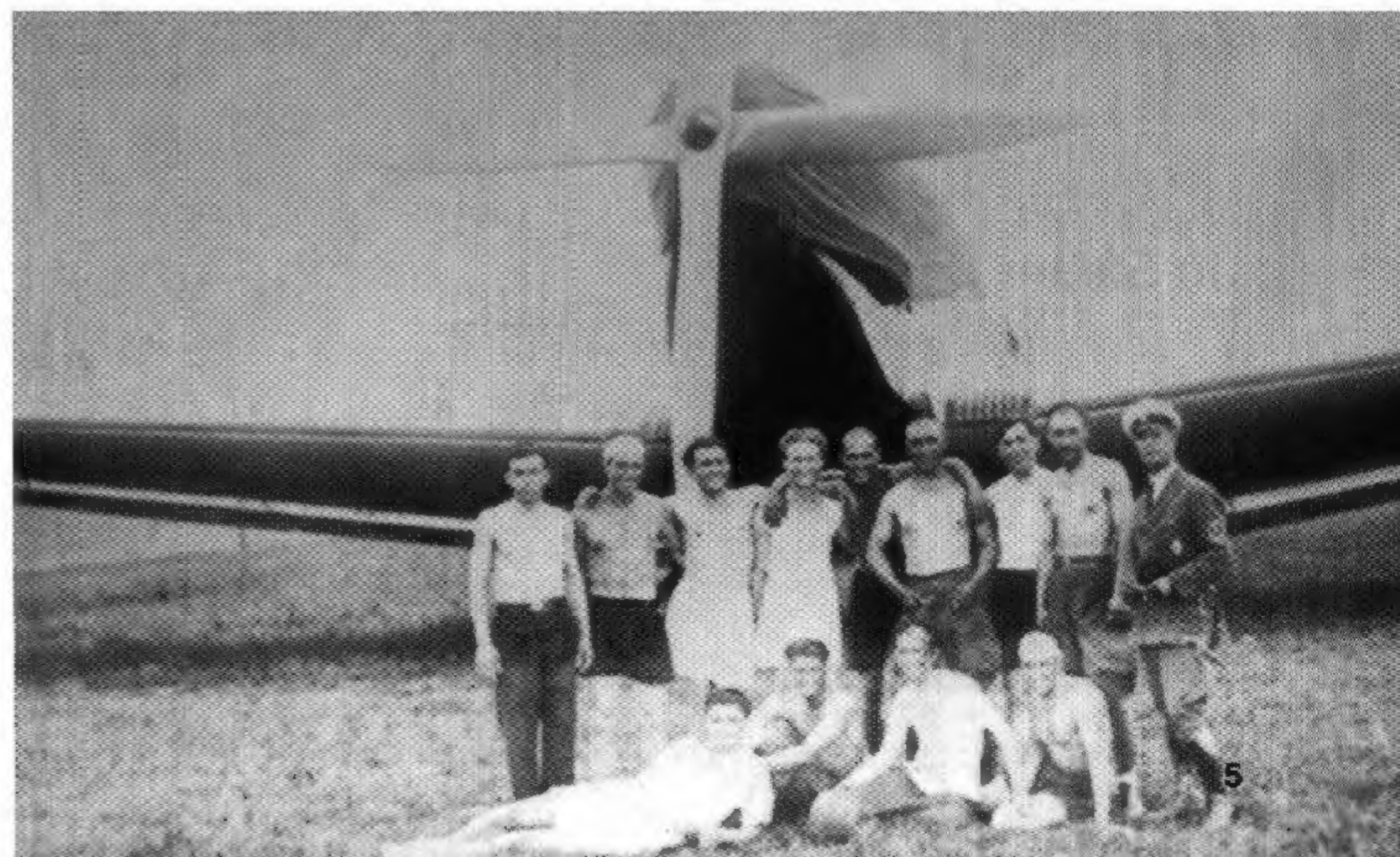
Assembly of the first **Ju 52 ba<sup>3</sup>** prototype (*Werk Nummer* 4001<sup>4</sup>) began in early 1930 and Junkers chief test pilot Wilhelm Zimmermann flew it for the first time from Dessau on 13 October 1930. Flight trials soon demonstrated the L88's unreliability and this powerplant was replaced by a 685 HP BMW VIIaU turning a two-bladed fixed pitch wooden propeller. This engine change resulted in the aircraft's redesignation to **Ju 52 be**. This re-engined aircraft was flown from Dessau to the *Deutsche Versuchsanstalt für Luftfahrt* (DVL; German Flight Research Institute) at Berlin-Adlershof for the state acceptance trials on 6 December 1930. The German government requested several aircraft equipment changes, while a 5 m (16 feet 4.8 inch) diameter four-bladed fixed pitch wooden propeller replaced the two-bladed propeller.

The *Reichsverkehrsministerium* (RVM; Reich Transport Ministry) issued an air worthiness certificate for the Ju 52 be in February of 1931 and the civil designation D-1974 was allocated to this aircraft. Junkers' newest transport was introduced as a 'flying boxcar' to the public and press at Berlin-Tempelhof airfield on 17 February 1931. Although the public and press warmly received the Ju 52 be, it did not receive any orders due to the worldwide economic depression.

The Ju 52 be was allocated to the air freight company *Luftfrako Air Express GmbH* for operational trials in June of 1931. The firm was well satisfied with this aircraft during the four-week trials before returning it to Junkers. The company then sent the aircraft on a *Balkan Vorführflug* (Balkan Demonstration Flight) later that summer. The Ju 52 be was modified for this journey by replacing the two circular front access door windows with rectangular windows. The engine cowling was painted black and JUNKERS was painted under the cockpit; the rest of the aircraft was left in natural metal. The 6000 km (3728.3 mile) tour took the Ju 52 be to Hungary, Romania, Bulgaria, Yugoslavia, Austria, and Czechoslovakia. Local media covered this trip well, but the continued weak economy throughout Europe resulted in no orders for this aircraft.



Junkers sent the Ju 52 be prototype on an Eastern European demonstration tour in the summer of 1931. The aircraft is parked at Bojurishte airfield near Sofia, Bulgaria during this tour. The nose was painted black and JUNKERS in black appears under the cockpit. One rectangular window replaced the two earlier circular windows in the front access door. (Stephan Boshniakov)



<sup>3</sup>Junkers used the first letter after the type designation to indicate the airframe, while the second letter stood for the engine type.

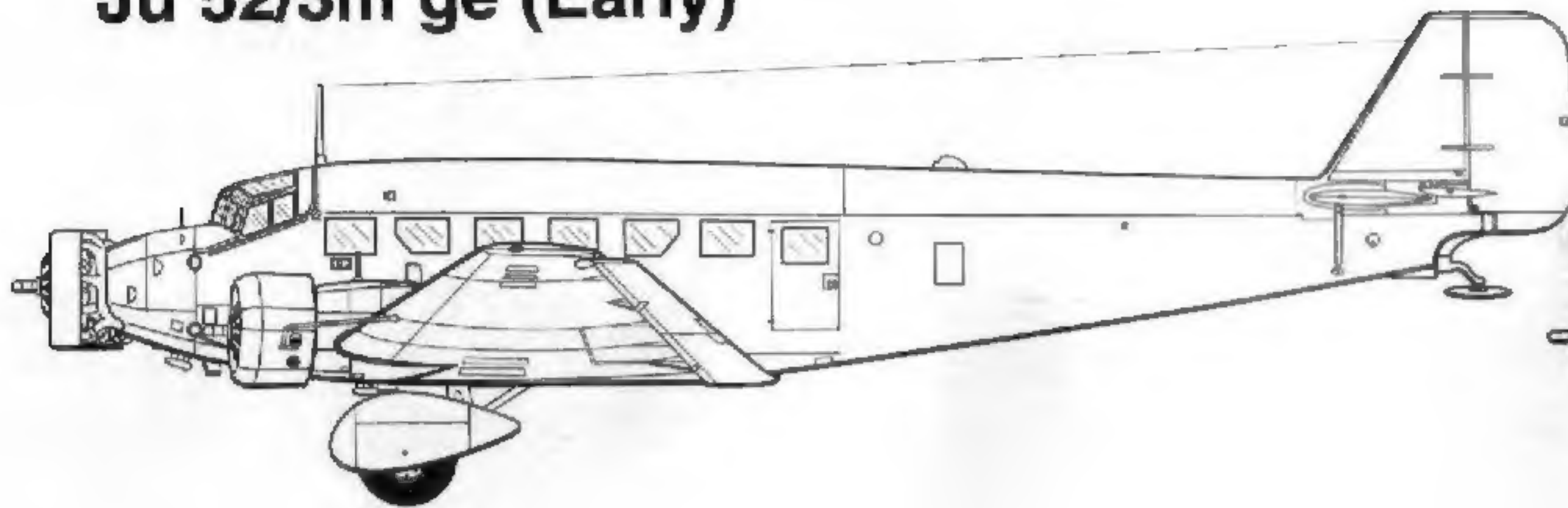
<sup>4</sup>*Werk Nummer* (*Werk Nr.*); Factory Number

Several Bulgarian men pose before the Ju 52 be while it was parked at Bojurishte during its 1931 demonstration tour. The BMW VIIaU engine turned a four-bladed wooden propeller 5 m (16 feet 4.8 inches) in diameter. Several days after this visit to Bulgaria, the Ju 52 be flew to Belgrade, Yugoslavia. The 1931 Eastern European tour covered 6000 km (3728.3 miles) while visiting six countries. (Stephan Boshniakov)

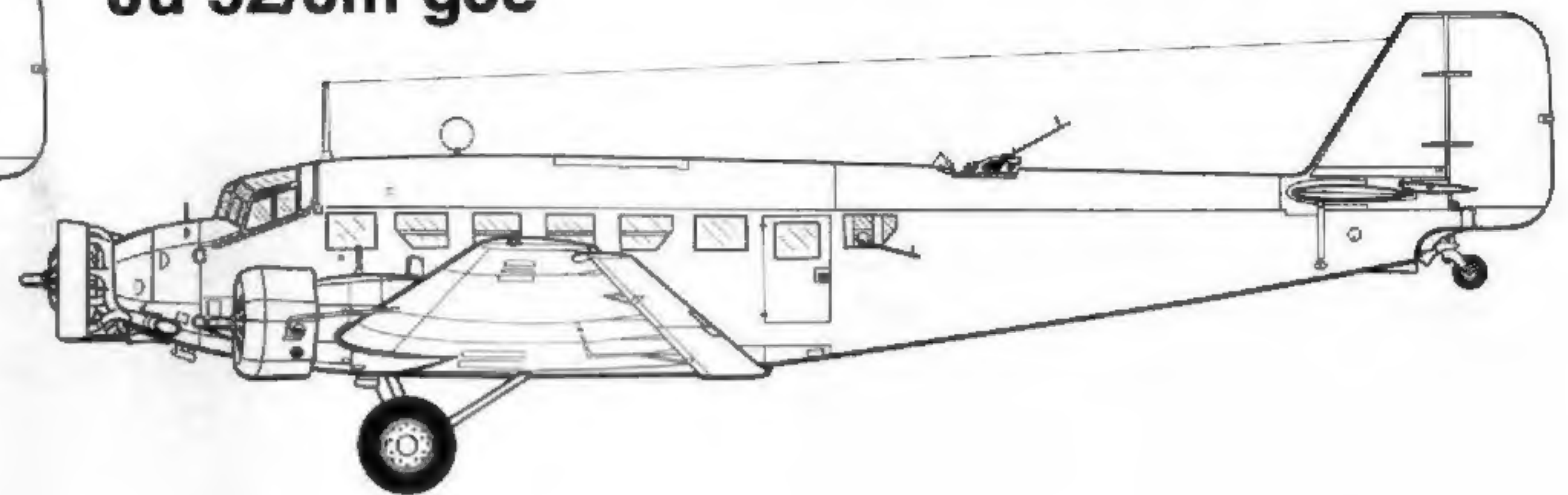


# Development

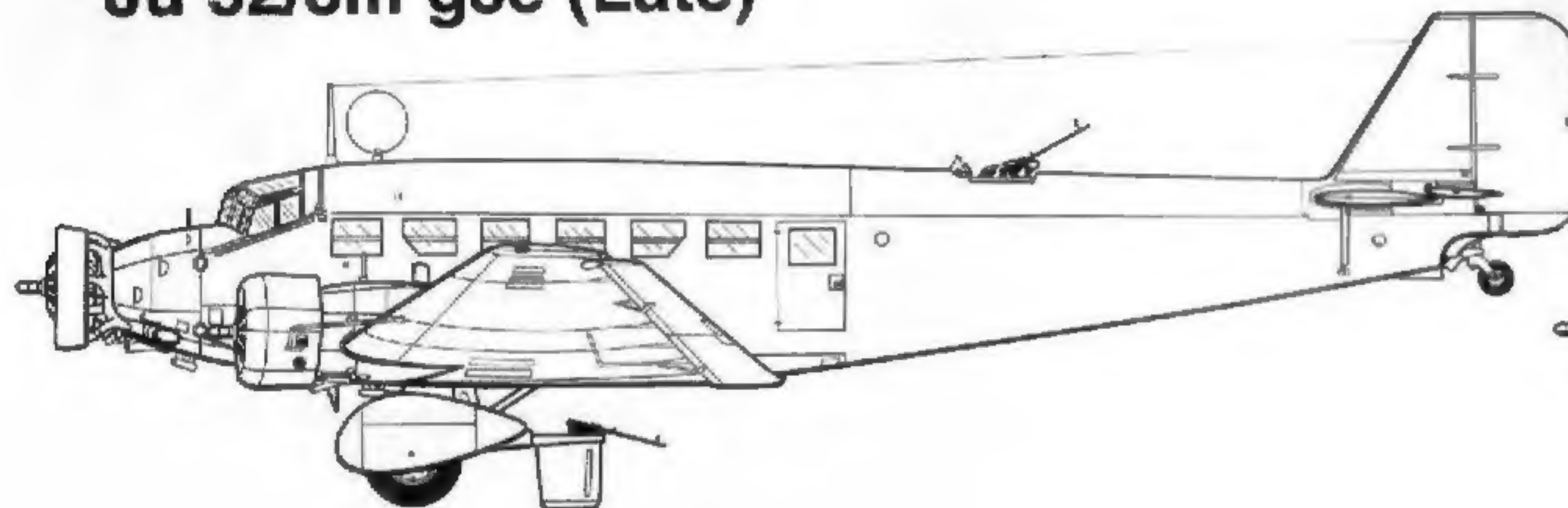
**Ju 52/3m ge (Early)**



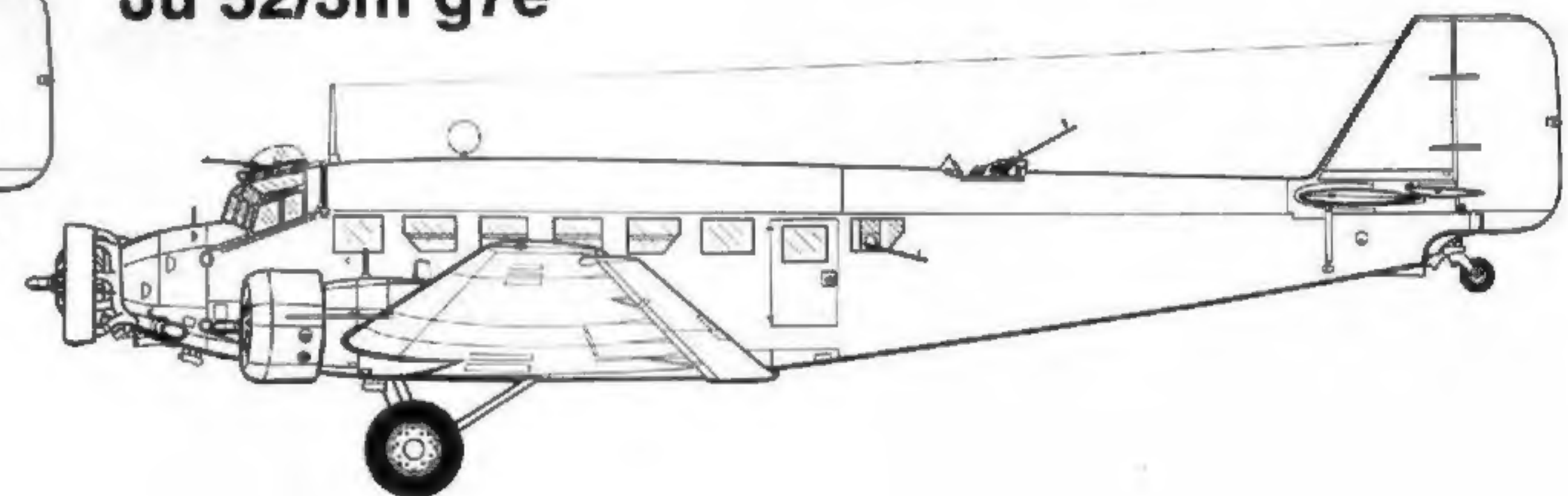
**Ju 52/3m g5e**



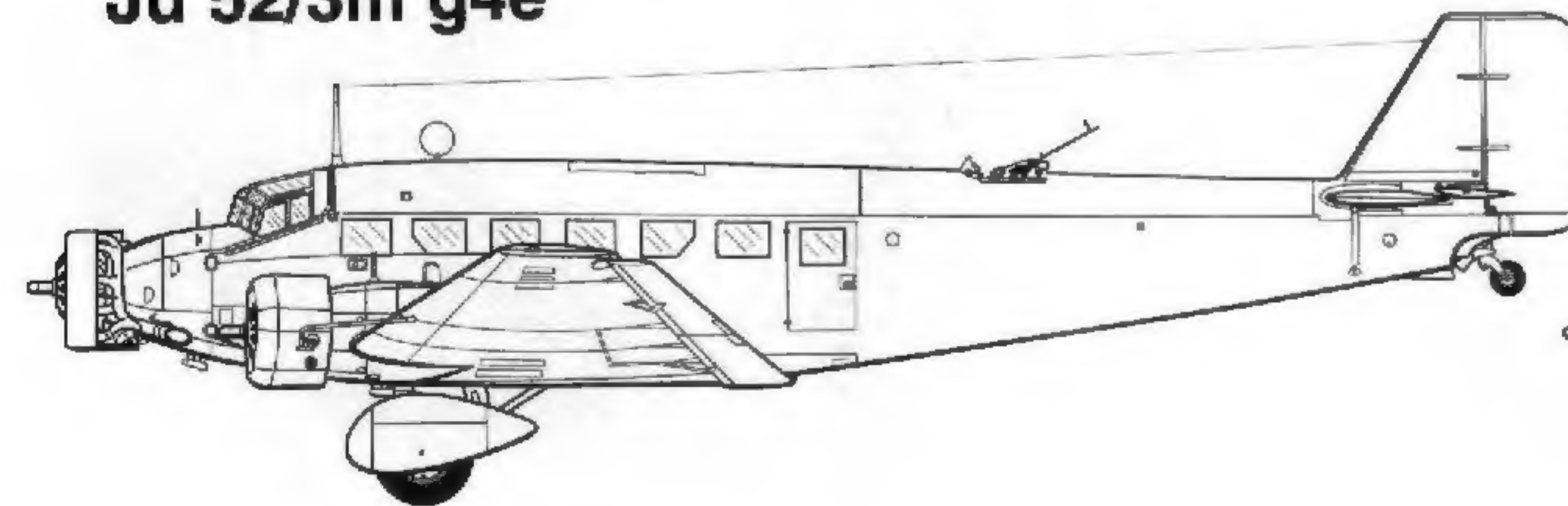
**Ju 52/3m g3e (Late)**



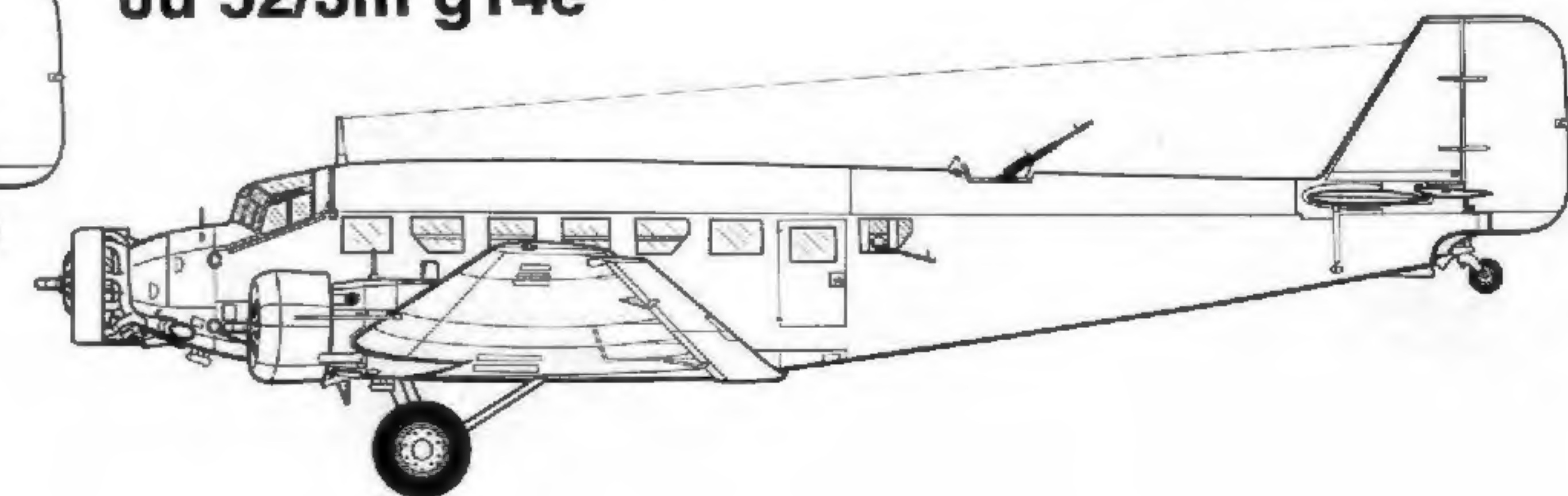
**Ju 52/3m g7e**



**Ju 52/3m g4e**



**Ju 52/3m g14e**





# Single-Engine Ju 52

The Junkers factory in Dessau began building the single-engine Ju 52 transport, despite a lack of firm orders for the aircraft. The **Ju 52 bi** (*Werk Nr.* 4002, D-2133) was the second prototype and made its first flight on 10 March 1931. This aircraft had a larger rudder than the earlier Ju 52 be and was powered by an 800 HP Armstrong Siddeley Leopard 14-cylinder, air-cooled, radial engine. The Leopard turned a two-bladed wooden propeller. This was the only single-engined Ju 52 equipped with a radial powerplant; the other five aircraft built had liquid-cooled inline engines. This second prototype was equipped with twin floats and flew operational floatplane trials from eastern Germany's Elbe River in July of 1931. A new, redesigned wing was fitted to this aircraft during the trials, resulting in a redesignation as the **Ju 52 ci**. It was used for sea trials from Travemünde on the Baltic Sea until November of 1931.

The **Ju 52 ce** (*Werk Nr.* 4003, D-USON<sup>1</sup>) was powered by the same 685 HP BMW VIIaU inline engine fitted to the Ju 52 be. It was used as a target tug for German Army anti-aircraft gunners. A second Ju 52 ce (*Werk Nr.* 4004, D-2317) was delivered to the *Deutsche Verkehrsfliegerschule* (DVS; German Commercial Pilot's School) in September of 1932. The DVS served as a cover for secretly training pilots for the Luftwaffe, which Germany was prohibited from having due to the 1919 Versailles Treaty. This aircraft was equipped with floats and used to train German *Kriegsmarine* (Navy) pilots before later becoming a test bed for torpedo-launching trials.

The first Ju 52 built for passenger service was the **Ju 52 cai** (*Werk Nr.* 4005, D-2356). This aircraft was equipped with 15 passenger seats in the fuselage, replacing the cargo hold of ear-

<sup>1</sup>The German civil aircraft registration system of D followed by up to four numbers was replaced by D followed by four letters in 1934.

The second Ju 52 ce (*Werk Nr.* 4004) is moored between flights during the late 1930s. It was originally delivered to the DVS (German Commercial Pilot's School) in September of 1932. The DVS clandestinely trained German military pilots before the Luftwaffe was revealed in 1935. The *Kriegsmarine* (Navy) used this Ju 52 ce for target towing duties.



lier Ju 52s. An 800 HP BMW VIIaU liquid-cooled, inline engine powered this machine. The Ju 52 cai received its civil certification in February of 1933, but was destroyed in a crash landing on 27 May 1933.

The first five single-engined Ju 52s were built for German government agencies or companies founded to camouflage the Luftwaffe's clandestine buildup. One Ju 52 ce (*Werk Nr.* 4006) was sold to Canadian Airways Ltd. in 1931. The aircraft was disassembled before it was shipped from Germany to Longueuil, Quebec, near Montreal on the ship BEAVERBRAE. Fairchild Aviation Company reassembled the Ju 52 ce at its Montreal factory, while Canadian Airways registered the aircraft as CF-ARM on 26 October 1931. The aircraft first flew from Montreal on 28 November 1931, flown by experienced bush pilot Alex Schneider. The Ju 52 ce was nicknamed the 'White Elephant' and flew a tour of eastern Canada and the northern United States. Following this tour, the aircraft entered Canadian Airways cargo service. The harsh Canadian climate proved troublesome to the BMW VIIaU engine and an 825 HP Rolls Royce Buzzard 12-cylinder, liquid-cooled, inline engine replaced it in January of 1936. The Buzzard had shorter engine exhaust stacks to those on the BMW VIIaU. This powerplant change resulted in the Ju 52 ce being redesignated the **Ju 52 cao**.

The aircraft hauled a variety of cargo during its operations in northern Canada. The freight ranged from dynamite, ore buckets, and lumber for mining companies and dam construction firms to furs and fish delivered to railroad junctions. Canadian Airways Ltd. was acquired by the Canadian Pacific Railway in 1941 and the Ju 52 cao was reassigned to Canadian Pacific Air Services Ltd. The Buzzard engine was nearly worn out by this time and five replacement engines were ordered; however, a German submarine sank the ship carrying the Buzzards to Canada. Canadian Pacific Air Services removed the Ju 52 cao from service in 1943 and it was stored at Winnipeg, Manitoba before being scrapped in 1947.

The last single-engined Ju 52 built was a Ju 52 ce (*Werk Nr.* 4007), which was allocated to the Luftwaffe in November of 1935. Given the civil registration D-UHXY, the seventh and final Ju 52 completed served as a target tug.

Canadian Airways Ltd. acquired a Ju 52 ce (CF-ARM, *Werk Nr.* 4006) in November of 1931. A crane is preparing to hoist this aircraft onto the water. The Ju 52 ce was equipped with either wheels, floats, or skis for various flight conditions in Canada. Canadian Airways operated CF-ARM on cargo flights between late 1931 and 1943. (National Aviation Museum)







A Colombian Air Force Ju 52/3m de (622, *Werk Nr.* 4011) warms up its nose engine prior to a mission. It had the large rectangular cabin windows that were typical on early Ju 52/3ms. This machine was also equipped with two square windows in the starboard nose door. Colombia's Ju 52/3ms were the first to see combat during its Leticia conflict with Peru in the summer of 1932. (Harold Thiele)

This float-equipped Ju 52/3m ce (SAMPO, OH-ALK, *Werk Nr.* 4014) prepares to depart from Katajanokalla, Helsinki's sea airport in the summer of 1932. Aero O/Y flew this Junkers on its Helsinki-Turku-Stockholm route. This Ju 52/3m ce had its crew access door mounted on the port forward fuselage; other pre-series Ju 52/3ms lacked this hatch. (Klaus Niska)



## Ju 52/3m Pre Series

The single-engined Ju 52's lack of financial success brought Junkers to near bankruptcy by 1932. The German airline *Deutsche Lufthansa* (DLH) refused this aircraft and demanded a three-engined version. *Dipl.-Ing.* Ernst Zindel revised the Ju 52 design for three 600 HP Pratt & Whitney Hornet nine-cylinder, air-cooled, radial engines. One engine was mounted on the nose, while the other two powerplants were fitted to nacelles added to the wings. Each engine turned a two-bladed Junkers metal propeller.

This modification was made to a pair of Ju 52 ces (*Werk Nr.* 4008 and 4009) on the Dessau production line in early 1932. Two rectangular windows were added to each mid-fuselage side, while a large, two-piece cargo door was fitted to the rear starboard fuselage. Both aircraft were redesignated **Ju 52/3m de** and the first of these (4008) made its maiden flight on 7 March 1932. Both aircraft made short trial flights in Germany before they were shipped that summer to their customer, the Bolivian airline *Lloyd Aero Boliviano* (LAB). The airline began commercial services with their Ju 52/3m des in October of 1932.

LAB's order for the Ju 52/3m was soon followed by a three-aircraft order placed by the *Fuerza Aerea Colombiana* (FAC; Colombian Air Force). These aircraft (*Werk Nr.* 4010 to 4012) were also single-engined Ju 52 ces converted to Ju 52/3m de standard on the production line. The FAC's Ju 52/3ms were the first Junkers tri-motors to see combat service, resulting from a border clash with Peru. On 31 August 1932, Peruvian troops occupied the strategic port city of Leticia on the upper Amazon River, along Peru's disputed border with Colombia. Colombian President Enrique Olaya Herrera sent troops and supplies on the three Ju 52/3ms to the surrounding Amazonas region to counter Peru's move. The League of Nations restored this area to Colombian control in July of 1933.

LAB in Bolivia ordered a third Ju 52/3m de (*Werk Nr.* 4018), which entered service on 17 September 1932 and was named CHOROLQUE. This aircraft had seven squared windows on both the port and starboard fuselage sides, while a cabin ventilation inlet was fitted atop the fuselage immediately aft of the cockpit section. Most Ju 52s had this inlet located in the aft

This Ju 52/3m ba (*Werk Nr.* 4016) was specially built for Romania's George Valentin Bibesco, president of the FAI. It was powered by three Hispano Sulza liquid-cooled engines: an Mb 12 in the nose and two NB 12s on the wings. Radiators were mounted under the nacelles, while five tubular oil coolers were located outboard on the wings. (Lufthansa)





fuselage. CHOROLQUE was lost in an accident on 17 January 1936.

The first Ju 52/3m built from the outset in a three-engine configuration was a **Ju 52/3m ce** (*Werk Nr.* 4013). DLH accepted the aircraft on 1 May 1932 and named it BOELCKE. Its original registration of D-2201 was changed to D-ADOM in 1934. The Ju 52/em ce was powered by three 525 HP BMW Hornet A nine-cylinder, air-cooled, radial engines, which were unlicensed copies of the Pratt & Whitney Hornet engine. This variant introduced seven square windows on each fuselage side and a small entrance door on the port aft fuselage. These replaced the two windows per side and the large cargo door on the earlier Ju 52/3m de. *Flugkapitän*<sup>1</sup> Willi Polte piloted BOELCKE to victory at the Third International Alpine Flying Competition at Zurich, Switzerland on 28 June 1932.

Lufthansa's second Ju 52/3m ce was *Werk Nr.* 4015, which was delivered on 10 September 1932. It was registered D-2202 (reregistered D-ADYL from 1934) and named RICHTHOFEN. Small Townend rings<sup>2</sup> were mounted on the wing engines at the factory, although this ring was later added to the center engine. RICHTHOFEN entered service on the Munich-Milan-Rome route on 1 November 1932.

The Ju 52/3m ce had a wing span of 29.3 m (96 feet 1.6 inches), a length of 18.9 m (62 feet), and a height of 6.1 m (20 feet). It had an empty weight of 5345 kg (11,783.5 pounds) and a maximum weight of 9200 kg (20,282 pounds). The Ju 52/3m ce's maximum speed was 290 kmh (180.2 mph), while its cruising speed was 245 kmh (152.2 mph). This aircraft's range was 914 km (567.9 miles). The Ju 52/3m ce accommodated up to 17 passengers and was flown by two pilots and a radio operator.

The Swedish airline *AB Aerotransport* also ordered a Ju 52/3m ce (*Werk Nr.* 4017) float-plane. Components were built by Junkers at Dessau and assembled by *AB Flygindustri* in Limhamn, Sweden. This Ju 52/3m ce was registered SE-ADR and first flew on 14 July 1932, but it was damaged while making a forced landing on this flight.

The final pre-series Ju 53/3m was a Ju 52/3m ce (*Werk Nr.* 4019), which was delivered to Lufthansa in early 1933. The aircraft was named JOACHIM VON SCHROEDER and was

originally registered D-2468, which was changed to D-AFIR in 1934. A small circular window was mounted on the port fuselage immediately aft of the rear entrance door, while an access hatch was located on the rear portside fuselage. The latter item became standard for all civil Ju 52/3m fe and Ju 53/3m ge aircraft, but not on military variants. All three BMW Hornet A engines were equipped with Townend rings from the outset. Junkers built 12 Ju 52/3m ce and de aircraft between 1932 and 1933.

The next variant was the **Ju 52/3m ci** (*Werk Nr.* 4014), which Junkers built for the Finnish airline *Aero O/Y*. Three Pratt & Whitney Hornet T2D-1 radial engines powered this aircraft, with the center engine turning a three-bladed propeller and the wing powerplants turning two-bladed propellers. A door was fitted aft of the cockpit on the port fuselage, while a Direction Finding (DF) loop antenna was placed atop the fuselage. It used a twin float arrangement for operating off coastal waters, although it also used a conventional undercarriage for flights from land. Junkers delivered the Ju 52/3m ci to *Aero O/Y* at Travemünde, Germany on 24 June 1932. Registered OH-ALK and named SAMPO, the airline placed it in service on the Helsinki-Turku-Stockholm route on 1 July 1932. This Ju 52/3m ci crashed while approaching Hyvinkää airfield in Finland on 31 October 1945.

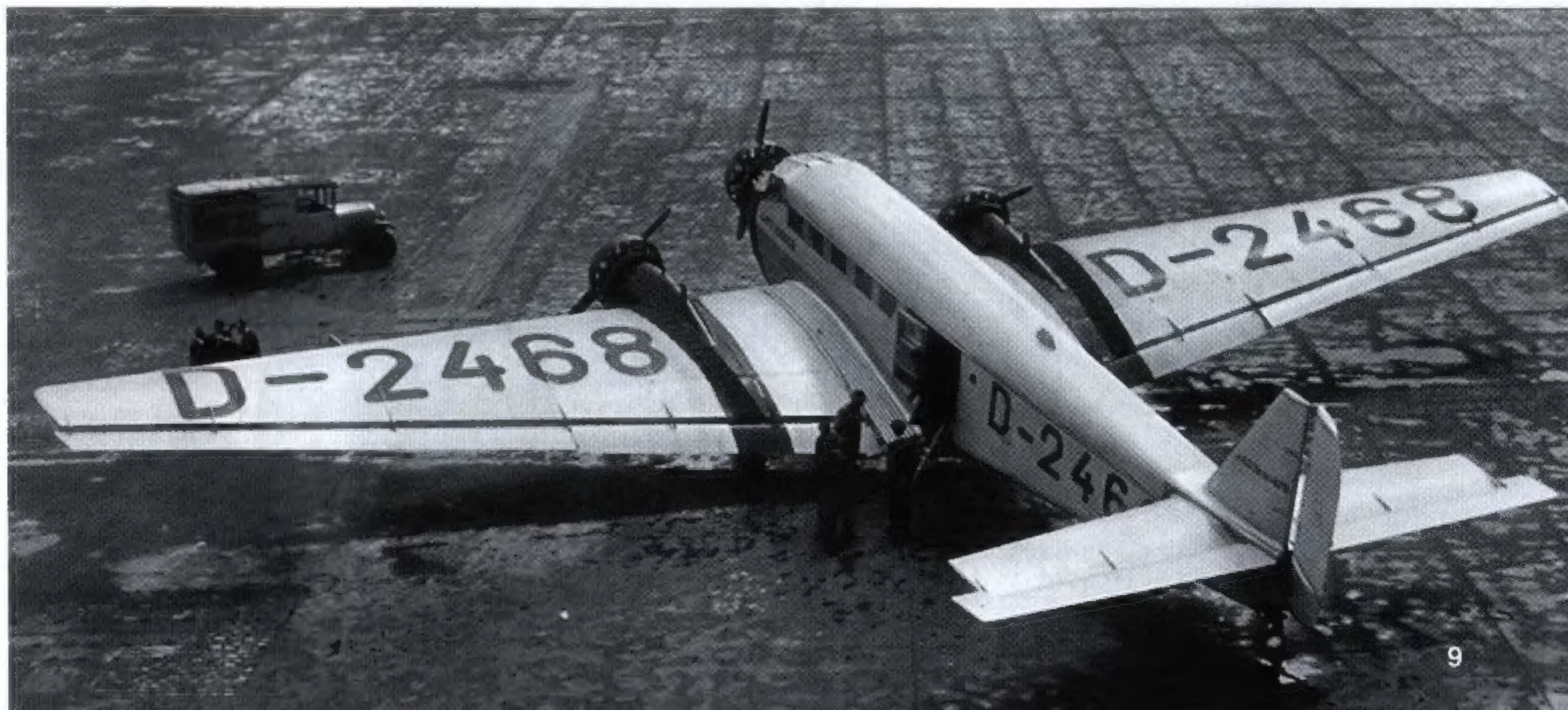
The sole **Ju 52/3m ba** (*Werk Nr.* 4016) was built especially for Romania's George Valentin Bibesco, President of the FAI<sup>3</sup> from 1930 to 1941. The center engine was a 750 HP Hispano Suiza MB 12 12-cylinder, liquid-cooled, inline engine turning a three-bladed propeller, while 575 HP Hispano Suiza NB 12 12-cylinder inline engines each turning a two-bladed propeller were mounted on the wings. A large coolant radiator and five tubular oil coolers were fitted under each wing. A tail wheel replaced the tailskid used on earlier Ju 52/3ms. The Ju 52/3m ba's empty weight of 6325 kg (13,944 pounds) was approximately 980 kg (2160.5 pounds) heavier than the standard Ju 52/3m ce. This aircraft was registered to Bibesco as CV-FAI and named ROMANIA on 1 April 1932.

<sup>3</sup>FAI: *Fédération Aéronautique Internationale* (International Aeronautic Federation), the Paris-based organization for certifying aerospace records.

<sup>1</sup>*Flugkapitän*; Flight Captain, a German civil aviation rank.

<sup>2</sup>A Townend ring is a ring-type radial engine cowling. The ring's chord (width) is rarely greater than the cylinders' external diameter and there is no attempt at a true airfoil shape.

This *Deutsche Lufthansa* Ju 52/3m ce (D-2468, *Werk Nr.* 4019) was the last pre-series airliner built at Junkers' Dessau, Germany plant. It was the first Ju 52/3m fitted with a small circular window aft of the port entrance door. A fresh air vent was mounted atop the aft fuselage. This aircraft was natural metal with nose and wing trim in black, while the black markings included the Lufthansa insignia on the rudder. No national markings were painted on the tail prior to Adolf Hitler's appointment as Chancellor on 30 January 1933. D-2468 was changed to D-AFIR in 1934, when Germany switched its civil registrations from numbers to letters. (Lufthansa)







Lloyd Aero Boliviano's Ju 52/3m de CHOROLQUE (Werk Nr. 4018) rests between flights. It does not have the usual Townsend ring on the center engine, but has a cockpit ventilation inlet mounted atop the fuselage. Most Ju 52/3ms had this inlet located on the aft fuselage. CHOROLQUE had the standard seven square cabin windows per side, while LAB's two earlier Ju 52/3ms had only two windows per side. (Lufthansa)



## Ju 52/3m de in the Gran Chaco War

The inhospitable and largely uninhabited Gran Chaco region is located between the Paraguay River to its east and the Andes Mountains to its west. Standard Oil Company discovered oil in this region in 1928. This discovery prompted Bolivia to assert its rights in the region against rival claims by Paraguay. Sporadic raids and skirmishes between the two countries began in 1928, before Bolivian President Daniel Salamanca Urey declared war on Paraguay in June of 1932.

Lloyd Aereo Boliviano (LAB) and its three Ju 52/3m des were heavily involved in this fighting. The first aircraft (Werk Nr. 4008) arrived in Bolivia in October of 1932. It was registered CB-17 and named JUAN DEL VALLE. The other machines came from Germany during 1933, including Werk Nr. 4009, registered CB-18 and named HUANUNI and Werk Nr. 4018, named CHOROLQUE, but not given any civil registration. Most of LAB's pilots and ground crewmen were either Germans or Bolivians of German descent.

The sturdy Junkers design proved ideally suited for the rough and unprepared airfields in the Andes region. They were used for twice daily supply flights between Fortin Munoz and Villa Montes, located in the Gran Chaco. These flights sent arms, ammunition, and supplies to the Gran Chaco and airlifted wounded troops out. The Ju 52/3m des flew these missions from late 1932 until the end of 1933.

Temperatures in the Andes region fluctuated by more than 40° between day and night. This caused the Ju 52/3m de crews to drain oil from the engines at the end of the day, in order to prevent frozen oil from damaging the engines. The frozen oil was thawed over open fires in the morning. Lack of fuel trucks and pumps forced ground crews to hand pump fuel into the Ju 52/3m des, a process that lasted up to eight hours.

The League of Nations imposed an arms embargo on Bolivia and Paraguay in 1932, which cut into both weapons and spare parts availability for these countries. This reduced the Ju 52's serviceability from 1934 until the conflict's end the next year. The three Junkers aircraft flew up to 40,000 Bolivian soldiers and over 4400 MT (4850 tons) of supplies during the three-year long war without a single accident. An armistice was signed between Bolivia and Paraguay on 14 June 1935, which ended the bloody conflict. Nearly 100,000 men were killed in the war, which brought both nations to the brink of collapse. The oil discovered there in 1932 was only found in limited quantities.

The three Ju 52/3m des were returned to LAB service after the Gran Chaco War. All three aircraft were lost in accidents, beginning with CHOROLQUE on 17 January 1936. HUANUNI was destroyed on 15 December 1937 and JUAN DEL VALLE crashed in eastern Bolivia on 3 November 1940.

Flight and ground crewmen – mostly German – stand before the Ju 52/3m de JUAN DEL VALLE (CB-17, Werk Nr. 4008) at Villa Montes, Bolivia. This airfield was the Bolivian Air Force's main base in the Gran Chaco region during its 1932-35 war with Paraguay. JUAN DEL VALLE was the first Ju 52/3m built, but it was destroyed in an accident on 3 November 1940. The wreckage still remains at the crash site in eastern Bolivia. (Harold Thiele)



# Civil Variants

## Ju 52/3m fe

In early 1933, Junkers refined the Ju 52/3m ce and de variants based on operational experience. The resulting **Ju 52/3m fe** included modifications to both the glazed canopy and the exhaust stack layout. The center BMW Hornet A radial engine was fitted with a Townend ring, while the wing engines were enclosed in larger NACA cowlings. Large aerodynamic fairings covered the main wheels. Most Ju 52/3m fes were equipped with an antenna mast atop the fuselage, immediately aft of the cockpit. These aircraft were fitted with a cabin ventilation inlet atop the aft fuselage, which became standard on subsequent Ju 52/3ms. DLH received most of the 15 Ju 52/3m fes built.

## Ju 52/3m ge

Junkers began production of the **Ju 52/3m ge** – an improved variant of the Ju 52/3m fe – in 1934. Both variants were similar in appearance, although a Direction Finding (DF) loop antenna was added beside the antenna mast atop the fuselage during the course of Ju 52/3m ge production. Early aircraft were powered by 525 HP BMW Hornet A radial engines, but most examples received the 690 HP BMW 132A nine-cylinder radial engine. Late production aircraft replaced the tailskid with a tail wheel.

Large numbers of Ju 52/3m ges were built for DLH and other airlines in Europe, South America, South Africa, and Asia. Examples completed for South African Airways deleted the squared window immediately aft of the cockpit. The wing engines were mounted parallel to the fuselage datum line, instead of the 6° angle common to early Ju 52/3ms. Aircraft assigned to the Brazilian airline *Syndicato Condor* – a Lufthansa subsidiary – had a second access door fitted to the port forward fuselage. This supplemented the starboard nose access door built into most Ju 52/3ms.

Most Ju 52/3m ges operated with fixed landing gear for land operation, but several aircraft were equipped with twin floats for waterborne flights. DLH, *Syndicato Condor*, Norway's *Det Norske Luftfartselskap*, and Uruguay's *Causa* flew these aircraft. The German-Soviet airline *Deruluft* equipped their Ju 52/3m ges with ski undercarriages for operating from snow-covered airfields between Berlin-Tempelhof and Moscow-Khodinka.

## Ju 52/3m reo

Junkers developed the **Ju 52/3m reo** for operating from high altitude airfields. It was powered by three BMW 132 Da or 132 De engines, which turned two-bladed variable-pitch propellers. These propellers required a larger spinner than on the Junkers PAK propeller fitted to most early Ju 52/3ms. The wing engines' NACA cowlings were modified from a conical shape in the earlier Ju 52/3m ge to a tube shape on the Ju 52/3m reo. The two exhaust stacks on each wing engine were moved from the outboard cowlings to the nacelle aft of the cowlings.

Most Ju 52/3m reos were delivered to airlines operating in the Andes Mountains region, where airfields were located at up to 3600 m (11,811 feet) above sea level. South American operators included *Lufthansa Sucursal en Peru* and Ecuador's SEDTA. DLH also flew Ju 52/3m reos on its European and Asian routes. The Luftwaffe commandeered several of these DLH aircraft soon after the outbreak of World War Two on 1 September 1939.



This Ju 52/3m ge (D-ALYL, *Werk Nr.* 5180) entered service with Lufthansa on 27 February 1935. It was briefly painted in a special scheme to promote the 11th Olympic Games in Berlin in August of 1936. Canvas covers protected the engines and cockpit windows while the aircraft was on the ground. On 27 March 1938, D-ALYL was transferred to Austria's ÖLAG airline and reregistered as OE-LAR. (Rupert Reisinger)

South African Airways (SAA) received this Ju 52/3m ge (ZS-AFD, *SIR BENJAMIN D'URBAN*, *Werk Nr.* 4059) on 29 October 1934. SAA's aircraft lacked the rectangular window immediately aft of the cockpit and normally found on Ju 52/3m ges. In 1938, SAA sold ZS-AFD to Lufthansa, which reregistered it as D-ACBO and renamed it V. NEUBRAND. (Lufthansa)







Personnel of Ecuador's SEDTA stand before a Ju 52/3m reo (HC-SAE, AZUAY, *Werk Nr.* 5109) in 1937. This variant's BMW 132 radial engines offered increased high altitude performance over earlier Ju 52/3ms. HC-SAE was originally delivered to *Syndicato Condor* in Brazil as PP-CBH MORÉ. In March of 1942, AZUAY was purchased by the American Defense Supply Corporation, who assigned it to the Ecuadorian Air Force. (Lufthansa)

D-AJYR EMIL SCHAEFER (*Werk Nr.* 4045) was one of two Ju 52/3m hos built. This variant was powered by Junkers Jumo 205 12-cylinder diesel engines. Both Ju 52/3m ho airliners served with Lufthansa between 1934 and 1935. The 1933-35 German national flag – black (top), white, and red – was painted on the starboard vertical tail; the Nazi swastika banner appeared on the port side. (Lufthansa)



## Junkers Ju 52/3m ho

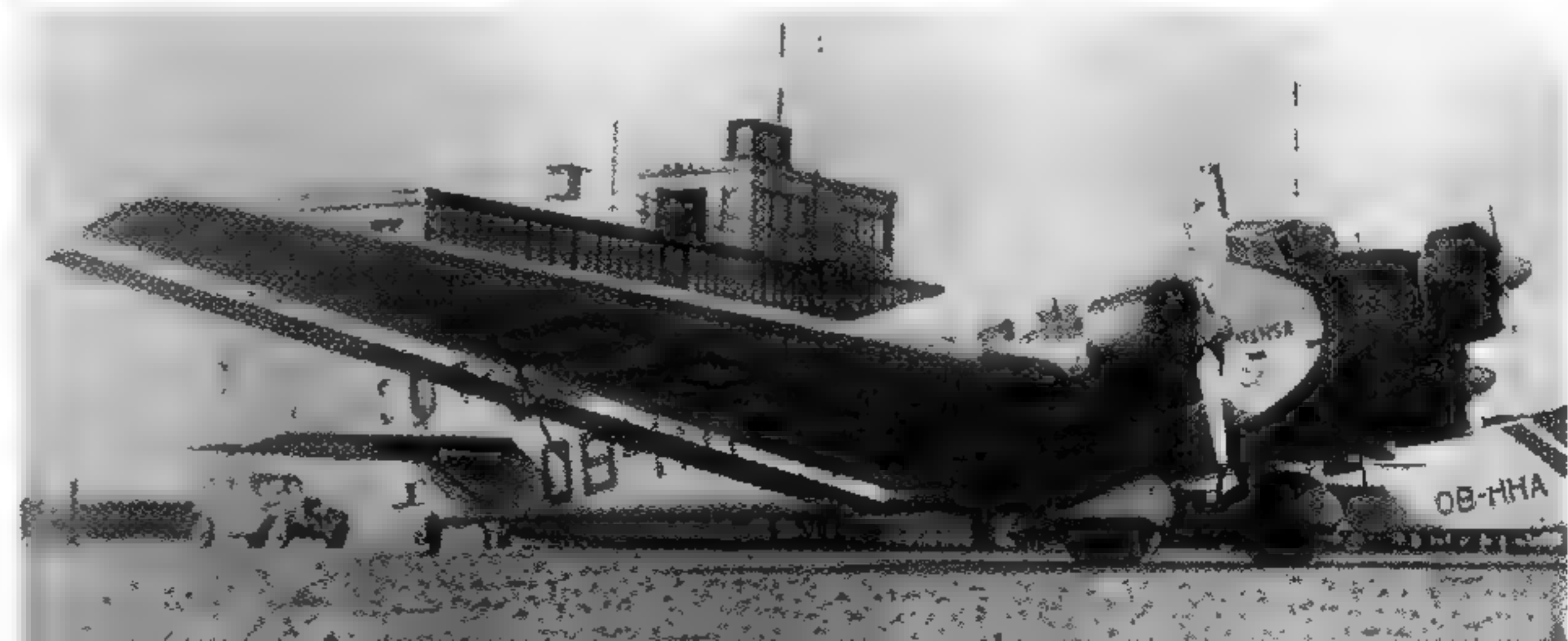
The Ju 52/3m ho was built to explore the use of diesel engines on airliners. Diesel engines burned inexpensive and less refined oil, compared to the more costly aviation gasoline used by conventional powerplants. This variant was powered by three 550 HP Junkers Jumo 205 12-cylinder, liquid-cooled, inline engines. The 500 kg Jumo 205's performance was comparable to the 525 HP BMW Hornet A radial engine fitted to early Ju 52/3ms. Junkers built two Ju 52/3m hos for DLH in 1934. These aircraft were named WALTER HÖHNDORF (*Werk Nr.* 4055, D-AQAR) and EMIL SCHAEFER (*Werk Nr.* 4045, D-AJYR). Both aircraft were retired from service in 1935.

## Export Junkers Ju 52/3m

Sweden's AB Aerotransport ordered two Ju 52/3m nai transports in 1934. This variant was similar to the Ju 52/3m ge, but was powered by 550 HP Pratt & Whitney Wasp S 3 H 1-G nine-cylinder, air-cooled, radial engines turning Hamilton Standard three-bladed constant speed propellers. Cockpit instruments included the Sperry gyro horizon and directional gyro and a Koolsman precision altimeter. Three oil coolers were installed under the nose, instead of the two coolers fitted to the Ju 52/3m ge. One of the Ju 52/3m nais (*Werk Nr.* 5440, SE-AER) was fitted with an access door on the port side nose. This variant also realigned the wing engines parallel to the fuselage datum line. Previous Ju 52/3ms had the engines mounted 6° off the datum line. Another Ju 52/3m nai (G-AERU, JUNO) was flown by British Airways Ltd. for postal flights from Britain to continental Europe prior to World War Two.

Italy's *Ala Littoria* airline operated the Ju 52/3m lu, which was powered by three 700 HP Piaggio Stella X nine-cylinder, air-cooled, radial engines. The Italians later replaced these powerplants with 800 HP Alfa Romeo 126 RC/34 nine-cylinder radial engines. The sole Ju 52/3m ge built for Poland's LOT was powered by 775 HP Bristol Pegasus VI nine-cylinder radial engines, which turned three-bladed variable pitch propellers. This was the same engine fitted to LOT's Douglas DC-2s and the common powerplant eased maintenance.

A Lufthansa *Sucursal en Peru* Ju 52/3m, HUANDOY (OB-HHC, *Werk Nr.* 5272) is parked at a Peruvian airfield in 1940. This aircraft was one of two Ju 52/3m reos transferred from Lufthansa to its subsidiary in Peru in 1940. Lufthansa *Sucursal en Peru*'s other Ju 52, HUASCARAN (OB-HHA, *Werk Nr.* 5060), is parked alongside HUANDOY. In March of 1941, the Peruvian government – under US pressure – requisitioned both Ju 52/3m reos. (Lufthansa)





# Junkers C-79

A Ju 52/3m ge became the first German aircraft captured by United States forces in World War Two. This aircraft (*Werk Nr.* 5283) was originally delivered to *Syndicato Condor*, *Deutsche Lufthansa's* Brazilian subsidiary, in July of 1935. The aircraft was reassembled after its seaborne delivery from Germany and flew acceptance trials in Brazil under the temporary German civil registration D-6. This Ju 52/3m ge had three tube-shaped oil coolers mounted under the center engine, instead of the two normally found on this variant. An access door was added to the port forward fuselage.

This Ju 52/3m ge passed its trials and received its Brazilian civil registration PP-CBA on 29 September 1935. The aircraft was the fifth Ju 52/3m to enter service with *Syndicato Condor*, which named it ACONCAGUA, after the mountain in the Argentinian Andes. This 6958 m (22,828 foot) tall peak is the highest mountain in the Western Hemisphere. On 31 August 1937, the Ju 52/3m ge was transferred to *Deutsche Lufthansa* and reregistered D-AENF, although it retained the name ACONCAGUA on the fuselage.

The airliner saw extensive service throughout South America, including brief leases with LAN Chile and *Lufthansa Sucursal en Peru* in 1938. This Ju 52/3m was transferred back to *Syndicato Condor* as PP-CBA on 11 December 1939. It was one of three *Syndicato Condor* Ju 52/3ms leased by Ecuador's SEDTA, another Lufthansa subsidiary. It flew primarily domestic flights, although it also flew routes to Bogota, Colombia and Lima, Peru.

Under US pressure, Ecuador seized the two Ju 52/3ms remaining in their country – including ACONCAGUA – on 3 September 1941. In early 1942, the US completed defensive agreements with Ecuador and Peru for the use of airbases, coastal defense facilities, and other cooperative measures. These agreements resulted in the transfer of ACONCAGUA to the US Caribbean Air Command (later the Seventh Air Force). The transfer took place at Talara Air Base on Peru's Pacific coast.

Lt Ned Kragness flew this Ju 52/3m ge from Talara to Albrook Field in the Panama Canal Zone. The US Army Air Forces (USAAF) designated this aircraft the C-79 and assigned the serial number 42-52883. The C-79 was taken to the Panama Air Depot at Albrook, where 525 HP Pratt & WHITNEY R-1690-23 Hornet nine-cylinder, air-cooled radial engines replaced the well-worn BMW 132 engines. These engines and cowlings were adopted from a Douglas DC-2 airliner. An additional cooler was added under each of the engine cowlings. A taller mast replaced the original antenna mast and the tail skid was exchanged for a tail wheel. Hydraulic brakes were substituted for the original air brakes, while American instruments and radios replaced the German equipment. The C-79 was then assigned to the 20th Troop Carrier Squadron at Albrook. The Junkers transport flew supplies to the islands of Curaçao and Aruba in the Netherlands Antilles.

In late 1943, the San Jose, Costa Rica-based airline TACA (*Transportes Aereos Centro-Americanos*) purchased the C-79 from the USAAF. TACA registered ACONCAGUA as TI-60 and flew it on behalf of the US Public Roads Administration to carry survey and construction crews engaged in building the Inter-American Highway. In early 1948, the C-79 was ferried to Nicaragua and registered with TACA de Nicaragua S.A. as AN-ACS. It was damaged beyond repair upon landing at Monte Carmelo, Nicaragua later that year.



*Syndicato Condor*, a Lufthansa subsidiary in Brazil, flew this Ju 52/3m ge (PP-CBA, *Werk Nr.* 5283) in the late 1930s. The aircraft was named ACONCAGUA and was later leased from *Syndicato Condor* by the Ecuadorian airline SEDTA. This Ju 52/3m was seized in Ecuador on 3 September 1941 and became the first German aircraft captured by the US in World War Two. (Lufthansa)

The USAAF took this Ju 52/3m ge (*Werk Nr.* 5283) into service as the C-79 (42-52883). It was assigned to the 20th Troop Carrier Squadron, Seventh Air Force at Howard Field, Panama Canal Zone. The Americans replaced the original BMW engines with Pratt & Whitney R-1690-23 powerplants in cowlings adopted from a Douglas DC-2. Additional engine cooling scoops were mounted under each engine. (Kenneth E. Marts via Dan Hagedorn Collection)





# Ju 52/3m g3e

Germany's newly formed *Luftfahrtkommissariat* (Aviation Commission) formed a *Behelfsbombergeschwader* (Auxiliary Bomber Wing) in October of 1933. This was done to skirt limitations against military aircraft under the Treaty of Versailles, which the victorious Allies imposed on Germany after World War One. This unit was officially named the *Verkehrsinspektion der DLH* (Traffic Inspectorate of *Deutsche Lufthansa*) and had received 24 Ju 52/3m ges and three Dornier Do 11Cs by 1 March 1934. The Do 11 proved disappointing in service and was soon withdrawn. Junkers improved on the existing Ju 53/3m ge by developing the **Ju 52/3m g3e** in 1934.

This variant retained the all-metal construction of previous Ju 52/3ms. Its fixed landing gear consisted of single wheel main gear units on the inner wing surfaces and a tailskid. Late production examples replaced this skid with a tail wheel for improved ground handling. The Ju 52/3m g3e had a wingspan of 29.3 M (96 feet 1.6 inches) a length of 18.9 M (62 feet), and a height of 6.1 M (20 feet). It weighed 5720 KG (12,610.2 pounds) empty and 9500 KG (20,943.6 pounds) fully loaded.

The Ju 52/3m g3e was powered by three 725 HP BMW 132A-3 nine cylinder, air-cooled, radial engines. Each engine turned a Junkers two-bladed metal propeller. The aircraft had a maximum speed of 275 KMH (170.9 MPH) at 915 M (3002 feet). The aircraft's service ceiling was 5900 M (19,357 feet) and it had a range of 1300 KM (807.8 miles) on 2400 L (634 gallons) of fuel. This fuel was located in ten wing-mounted tanks. These tanks were filled through two fuel filler caps, one each mounted atop the wing engine nacelles. A smaller oil filler cap was located forward of the fuel filler cap. The Ju 52/3m g3e's tactical radius was 500 KM (310.7 miles) while flying at 245 KMH (152.2 MPH) at 915 M.

A Ju 52/3m g3e (53+F12) auxiliary bomber is parked at a Luftwaffe airfield during the mid-1930s. The bombardier/ventral gunner's 'dustbin' position was retracted aft when the aircraft was on the ground. The g3e was the first Ju 52/3m variant built for the Luftwaffe and included a generator on the starboard fuselage. Unusually, an additional radio antenna was mounted on the starboard wingtip. (Ernö Nagy)



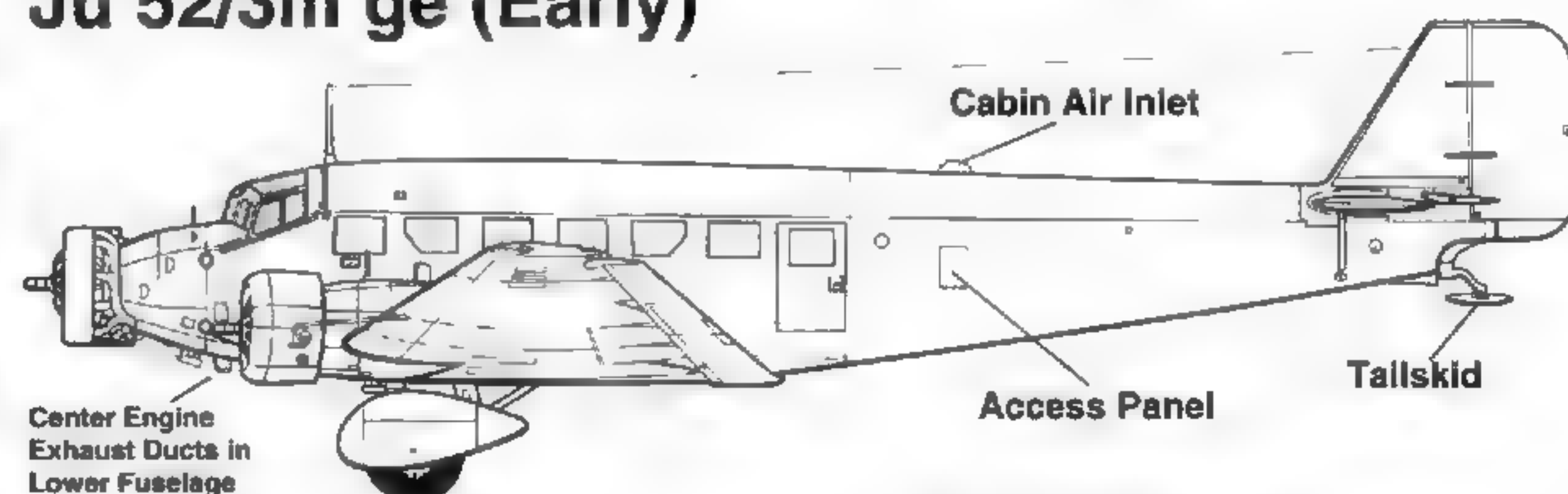
Three DSAC/250 bomb cells were mounted in the mid-fuselage and each cell could hold either two 250 KG (551.1 pound) or ten 50 KG (110.2 pound) vertically stowed bombs. The Ju 52/3m g3e had a maximum load of 1500 KG (3306.9 pounds). Defensive armament consisted of one 7.92MM Rheinmetall MG 15 machine gun with 1050 rounds in the open dorsal position and one MG 15 with 750 rounds mounted in a semi-retractable 'dustbin' ventral position. The latter position was manually lowered when enemy fighters threatened the bomber and raised to reduce drag. The 'dustbin' also served as the bombardier's position, which had windows for sighting the target. This position was located between second and third bomb cells. The Ju 52/3m g3e was crewed by four men: pilot, co-pilot/radio operator, dorsal gunner, and bombardier/ventral gunner.

A radio antenna mast was mounted on the forward fuselage, immediately aft of the cockpit area and offset to starboard. A large Direction Finding (DF) loop was placed aft of this mast and offset to port. A wind-driven electrical generator mounted along the upper starboard fuselage supplied electrical power.

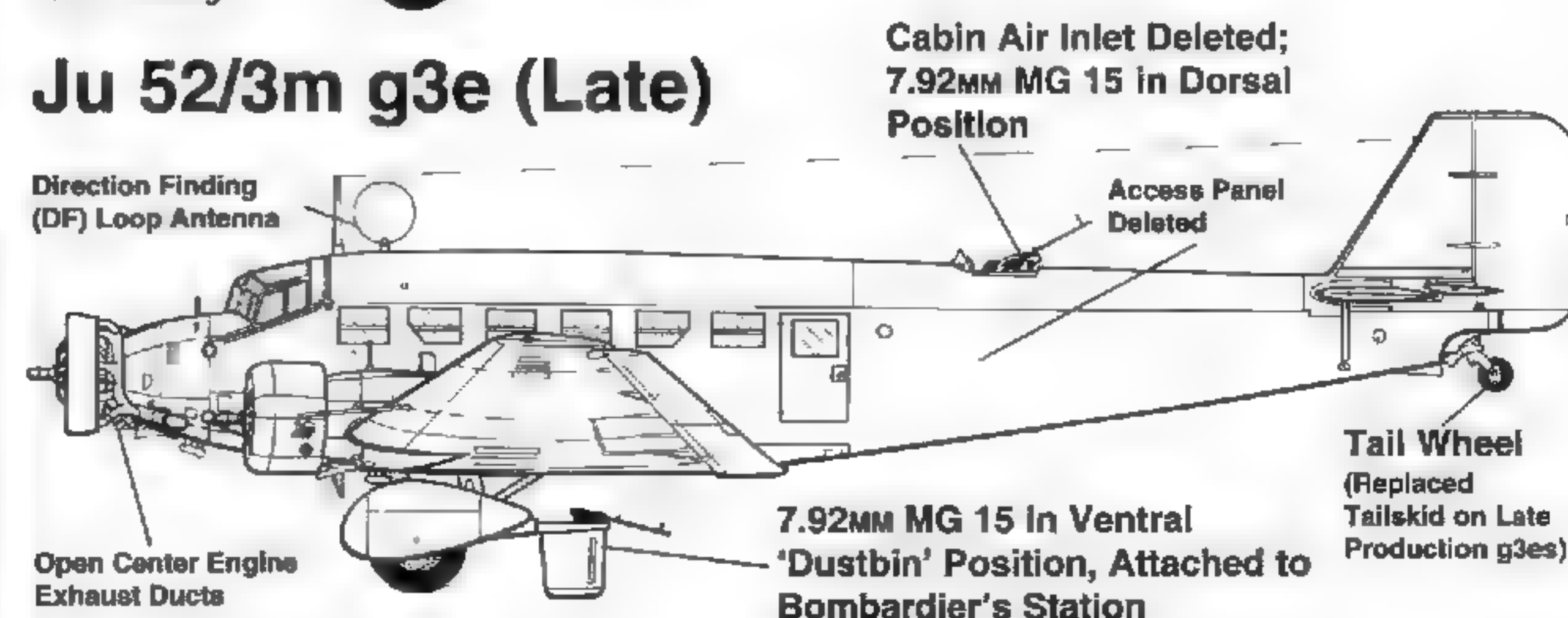
Ju 52/3m g3es were delivered to five Luftwaffe *Kampfgeschwadern* (Bomber Wings), beginning with KG 152 'Hindenburg' in late 1934. Junkers built 450 aircraft of this variant through 1935 – equipping two thirds of the Luftwaffe's bomber units. This variant saw extensive service during the Spanish Civil War, which began in July of 1936. Germany deployed 60 Ju 52/3m g3es to serve as both bombers and transport aircraft with the Spanish Nationalist forces. From 1937, the Ju 52/3m g3es were withdrawn from Luftwaffe bomber units and converted into transports. This entailed removing the bomb cells, bombardier's position, and the ventral 'dustbin' gun position. Ju 52/3m g3es could carry 18 passengers, 12 stretchers, or 1845 KG (4067.5 pounds) of cargo in the transport role.

Germany sold three Ju 52/3m g3e bomber-transporters to Austria in 1936 and reacquired them two years later when the Germans annexed Austria. Ten additional aircraft were sold to Portugal in 1938, where they were used as night bombers and transports.

## Ju 52/3m ge (Early)



## Ju 52/3m g3e (Late)







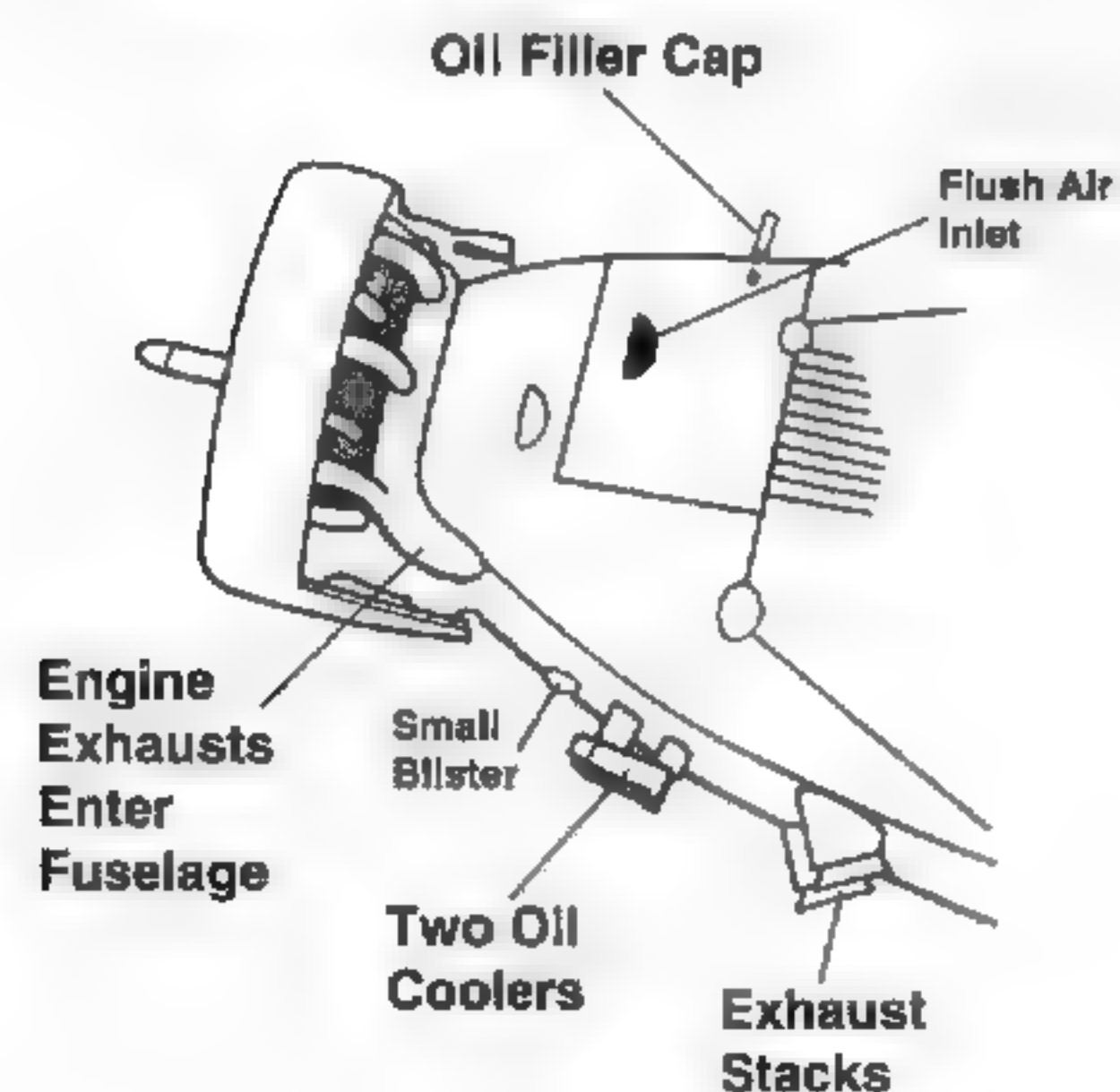
A Ju 52/3m is parked on a Norwegian airfield during the German campaign in the spring of 1940. Beginning with the Ju 52/3m g3e, the center engine's exhausts vented outward, instead of ducting inside the fuselage and out the bottom in the earlier Ju 52/3m ge. A small loop Direction Finding (DF) antenna is mounted atop the fuselage, aft of the antenna mast. (Bundesarchiv)



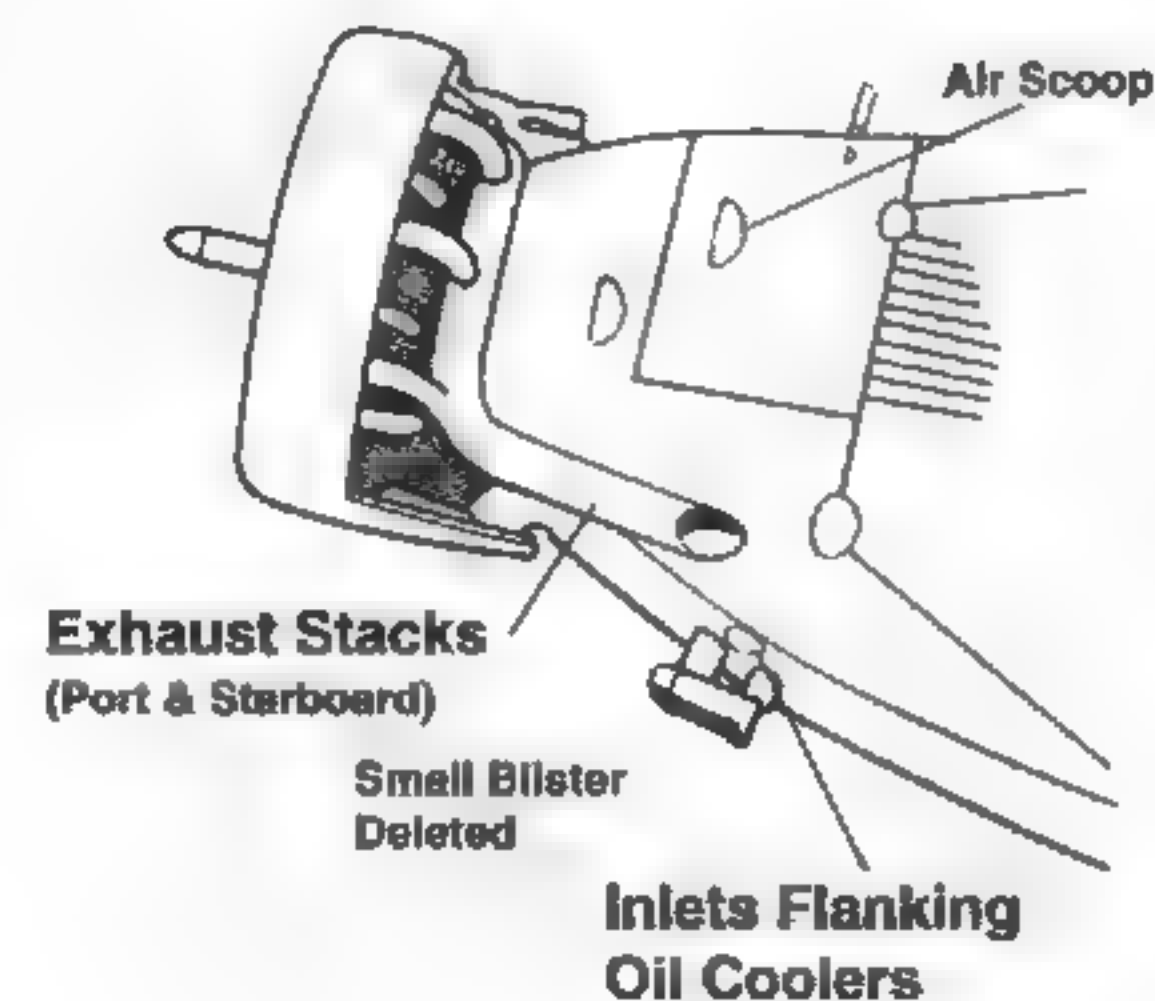
A Ju 52/3m g3e auxiliary bomber (50+G10) taxis at Vienna-Aspern airfield in 1939. Two red stripes painted on the fuselage indicated the aircraft's use during Germany's *Anschluss* (Annexation) of Austria on 13 March 1938. The g3e variant had a small cargo door on the starboard mid-fuselage. A wind-driven electrical generator is mounted above the first two starboard cabin windows. (Rupert Relsinger)

## Center Engine Exhaust Development

### Ju 52/3m ge

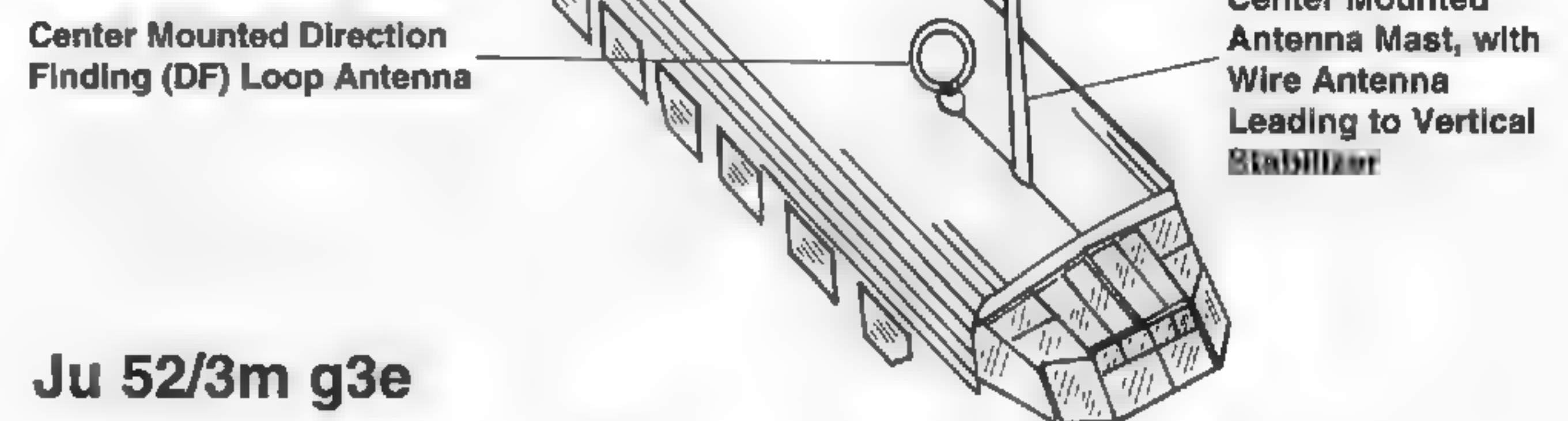


### Ju 52/3m g3e

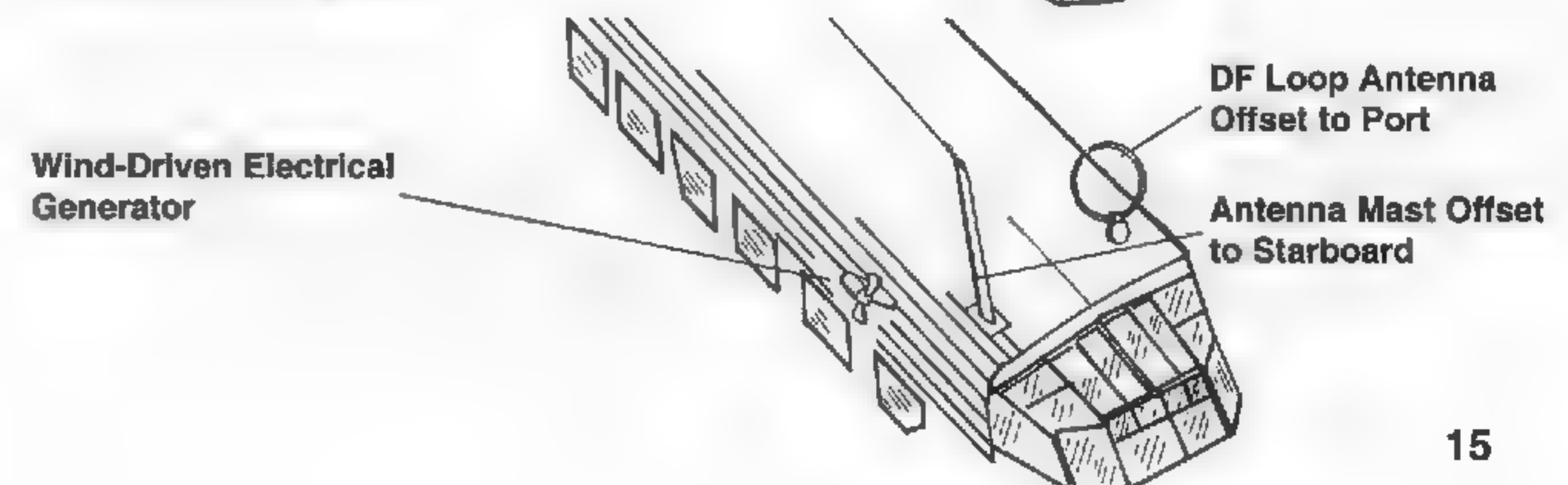


## Upper Forward Fuselage Development

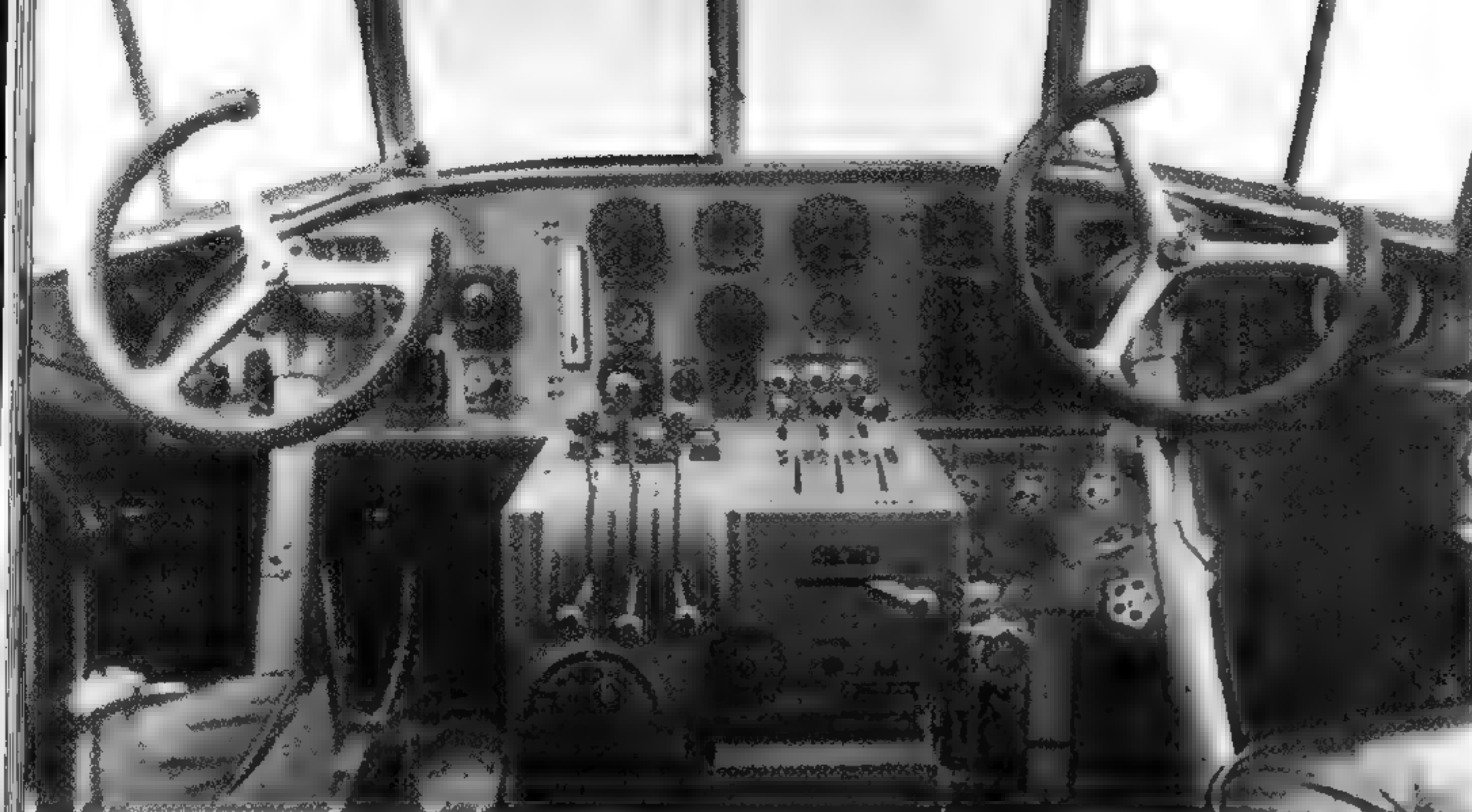
### Ju 52/3m ge



### Ju 52/3m g3e







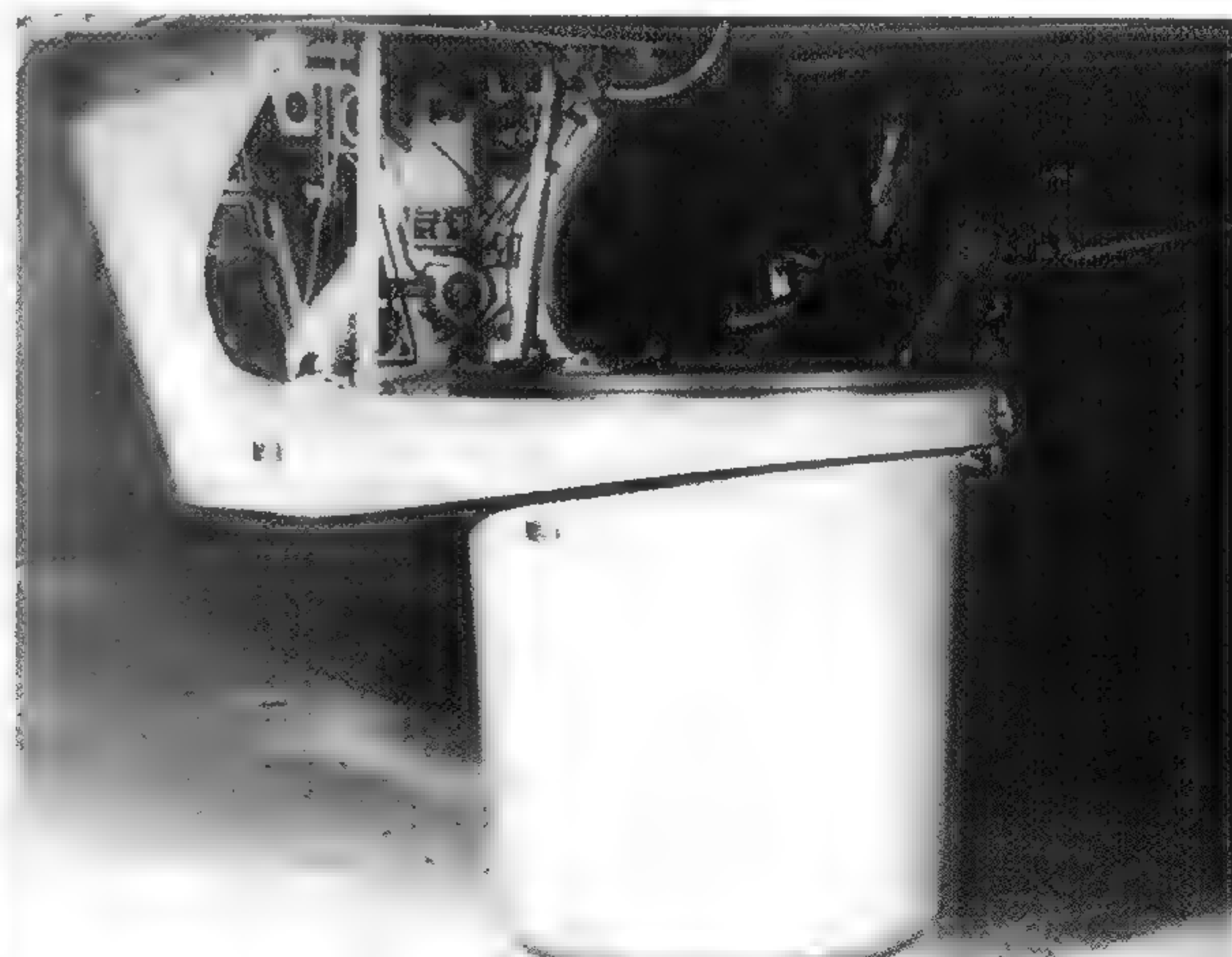
The Ju 52/3m g3e's pilot (port) and co-pilot (starboard) had dual flight controls. The columns controlled the elevators, while the wheels controlled the ailerons. The three throttles were mounted beside the pilot's seat, but could be accessed by the co-pilot. Military Ju 52/3m interiors were primarily RLM 02 RLM Gray (FS36165). (Rupert Reisinger)



This military Ju 52/3m g3e was converted into a staff and Very Important Person (VIP) transport, with two rows of six seats per row. These seats were not as luxurious as those found on Ju 52/3m airliners, but were better than the folding canvas seats along the walls of Ju 52/3m military transports. Small overhead racks held light luggage. (Rupert Reisinger)

The bombardier's semi-glazed position is mounted on the Ju 52/3m g3e's lower fuselage. A maximum bomb load of 1500 kg (3306.9 pounds) was vertically mounted in DSAC/250 cells located forward and aft of the bombardier. Luftwaffe Ju 52/3m g3es were originally painted RLM 63 Green Gray (FS36373), with RLM 22 Black (FS37038) trim.

A ventral 'dustbin' position was mounted to the Ju 52/3m g3e's bombardier position. This turret was armed with one 7.92mm Rheinmetall MG 15 machine gun with 750 rounds. Due to excessive drag, the 'dustbin' was lowered only when enemy fighters were present. This gunner doubled as the bombardier, whose sight was located behind the forward facing glass. (Manfred Griehl)





# Ju 52/3m g4e

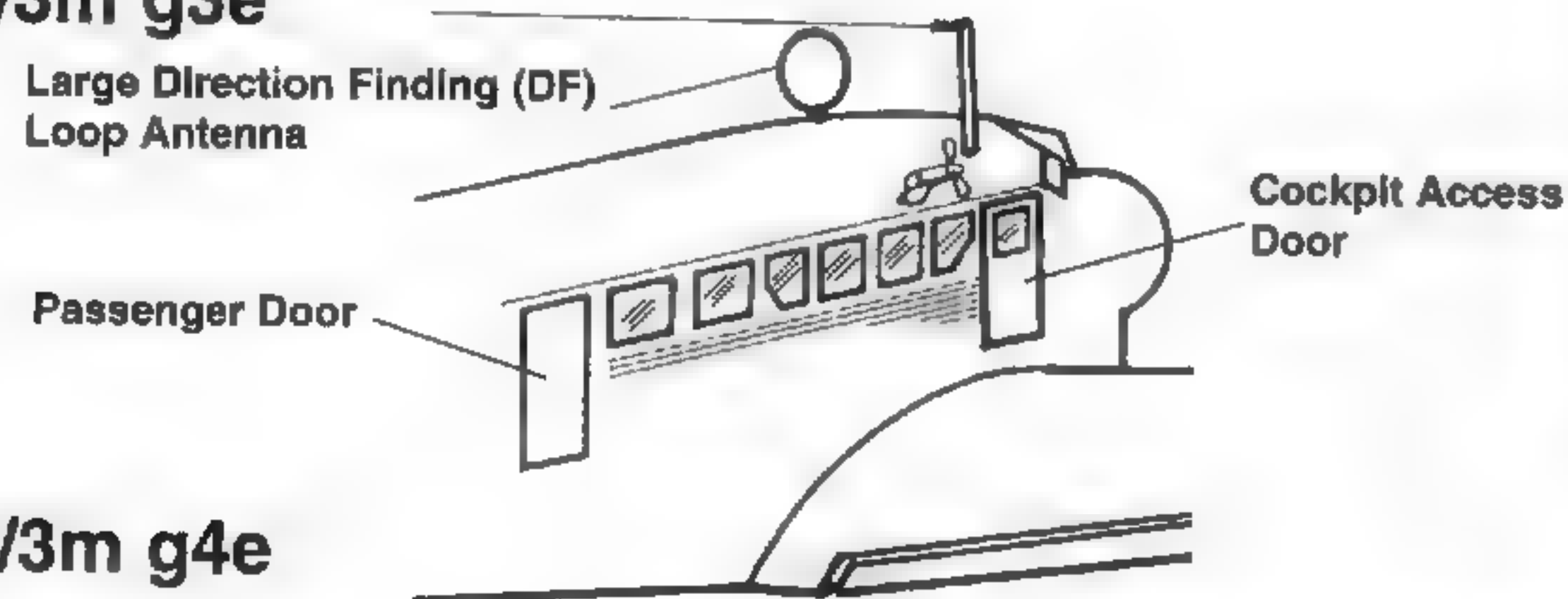
Although the Ju 53/3m g3e was largely successful, the aircraft was difficult to taxi around Germany's poorly surfaced runways. The tailskid did not provide the steering necessary under these conditions. This was corrected in late production Ju 53/3m g3es, which installed a single tailwheel in place of the skid. The tailwheel became standard on the Ju 52/3m g4e, which was introduced in 1935. This variant also featured some internal equipment changes, including a strengthened main cabin floor and strengthened landing gear. A cargo hatch was added to the roof for loading and unloading bulky cargo. This hatch was previously installed in single-engine Ju 52s. It could also be equipped for the auxiliary bomber role. All other Ju 52/3m g4e dimensions remained the same as the earlier Ju 52/3m g3e.

Several Ju 52/3m g4es were delivered to Spain for service with Germany's *Legion Condor* during the Spanish Civil War. These aircraft were used alongside Ju 52/3m g3es for both bombing and transport missions. The Luftwaffe converted their auxiliary bombers into transports by 1939. Three Ju 52/3m g4es were sold to Switzerland in 1939 and these saw service until September of 1982.

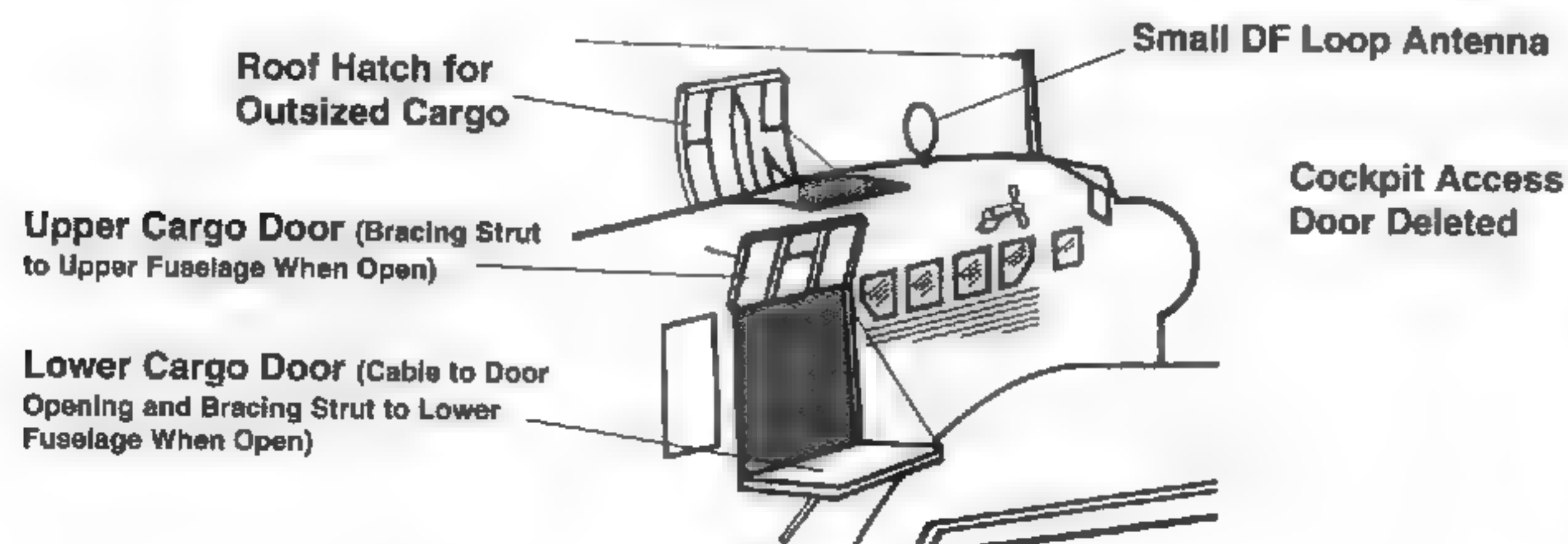
By late 1938, Junkers completed Ju 52/3m production at Dessau with this variant. Weser Flugzeugbau also built Ju 52/3m g3es and g4es, but also ended production of this aircraft that year. These factories were needed for other aircraft with higher priorities, including the Junkers Ju 88 bomber. By the start of 1939, Ju 52/3m production was continuing at the Junkers plant at Bernburg and at the ATG factory at Leipzig. Both firms began producing the aircraft during the Ju 52/3m g3e program.

## Cargo Door Development

### Ju 52/3m g3e



### Ju 52/3m g4e



The roof and starboard cargo doors are opened on this Ju 52/3m g4e (VK+AZ). This variant was similar to the earlier Ju 52/3m g3e, but added a second starboard door and reintroduced the roof hatch. The g4e was fitted with a smaller DF loop antenna on the upper fuselage, compared to the large loop mounted on the Ju 52/3m g3e. Standard wartime Ju 52/3m camouflage colors were RLM 70 Black Green (FS34050) and RLM 71 Dark Green (FS34079) upper surfaces and RLM 65 Light Blue (FS35352) undersurfaces. (Manfred Griehl)

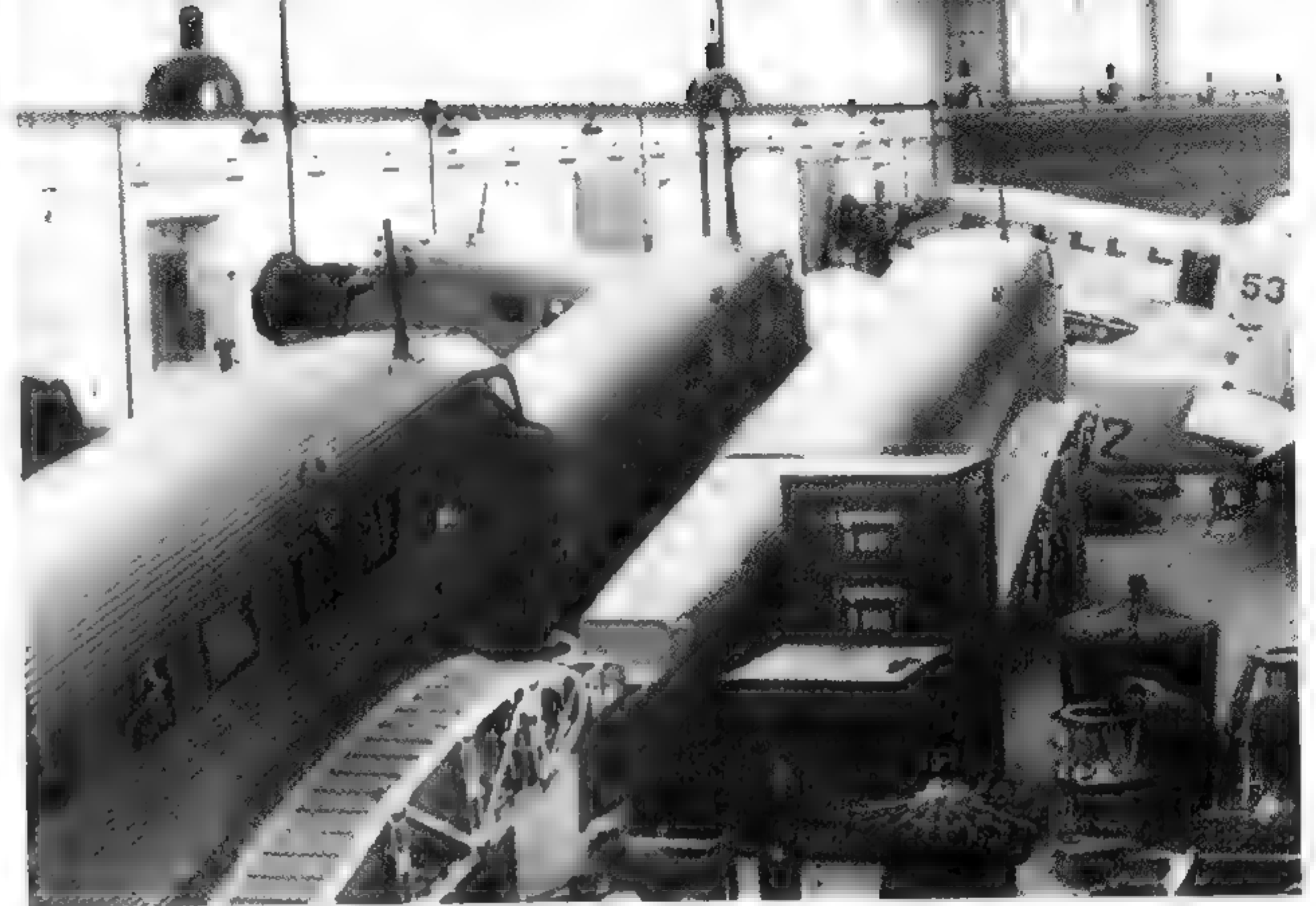
An overall white Ju 52/3m g4e (D-TABX) takes on supplies at a Luftwaffe airfield in France in 1940. This aircraft dropped emergency equipment to aircrews shot down in the English Channel during the Battle of Britain. This Ju 52/3m g4e was originally built as a g3e and retained its starboard nose entrance door when it was updated to g4e standard. The *Reichsdienstflagge* (Reich Service Flag) is painted on the vertical tail and red crosses appear on the fuselage and wings. (Bohumir Kudlicka)







This Luftwaffe Ju 52/3m g4e had the standard cabin interior found on Ju 52/3m military transports. The roof hatch was opened from the inside and had structural supports on the inner surface. Canvas seats along the walls folded for increased cargo stowage. This aircraft could carry 18 fully equipped troops, 12 stretchers, or 1845 kg (4067.5 pounds) of cargo. The double door on the bulkhead provided access to the aft fuselage and dorsal gunner's position. Military Ju 52/3m cabin interiors were painted RLM 02 RLM Gray. (Bundesarchiv)



The *Wiener Neustädter Flugzeugwerke* in Wiener Neustadt, Austria rebuilt several Ju 52/3m g3es to g4e standard. These aircraft retained the crew access door located on the port nose of the g3e variant. The firm installed two-piece cargo doors on the starboard side during the modification to Ju 52/3m g4e specifications. (Rupert Reisinger)

The Ju 52/3m g4e and other military variants were armed with one 7.92mm MG 15 machine gun in the dorsal position. This weapon traversed a full 360° and was supplied with 1050 rounds of ammunition. The gunner aimed the MG 15 using a post-and-ring sight mounted above the gun barrel. A small windshield partially protected the gunner from the airstream. (Bundesarchiv)





# Ju 52/3m g5e/g6e

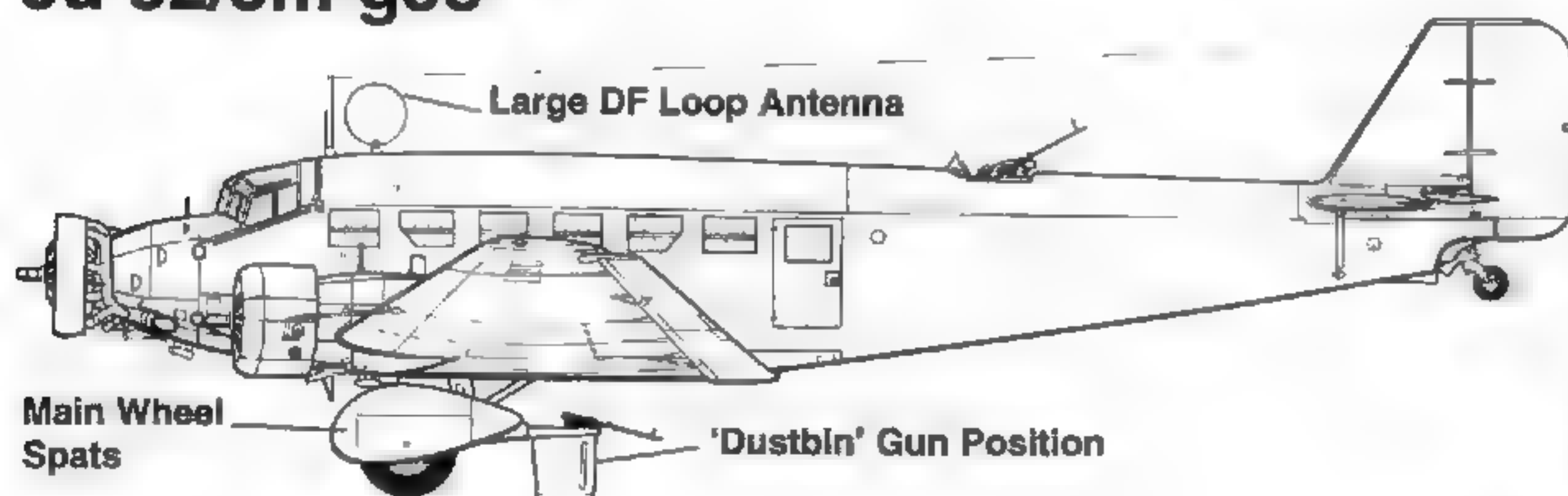
Junkers made only minor changes to the Ju 52/3m g4e in 1939, introducing the Ju 52/3m g5e that year. This variant retained the Ju 52/3m g4e airframe, but made it more versatile by providing for a choice of landing gear. The standard fixed gear for land operations could be easily replaced with twin floats for waterborne flights or with skis for flying off snow-covered airfields. It also had improved radio equipment installed for better communications with surface forces. A de-icing system was fitted, which used hot exhaust gases to warm the wing leading edges. This prevented ice from building up on the wings, which led to a loss of lift and altitude.

The Ju 52/3m g5e's external dimensions were unchanged from the previous variants. The wingspan was 29.3 m (96 feet 1.6 inches), with a length of 18.9 m (62 feet) and a height of 6.1 m (20 feet). This variant was powered by three 830 HP BMW 132T-2 nine-cylinder, air-cooled, radial engines.

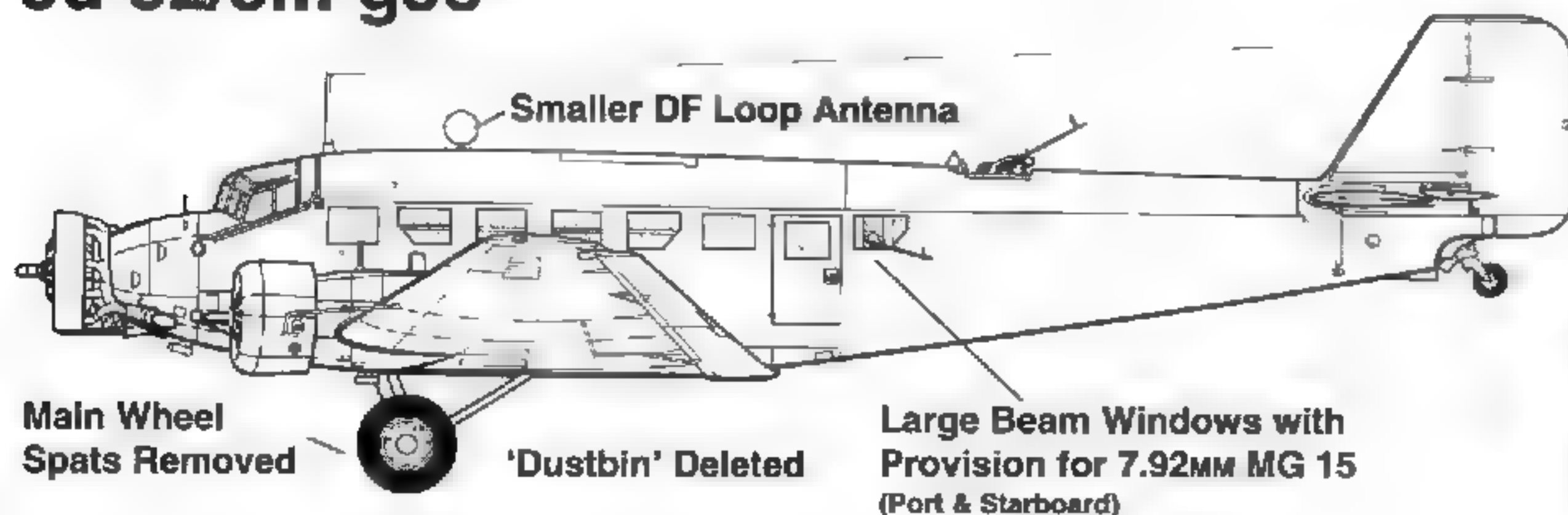
A 7.92mm MG 15 machine gun was mounted in open aft dorsal position to provide some defense against enemy fighters, but the ventral dustbin position was deleted. Ju 52/3ms were no longer built for the auxiliary bomber role, due to the presence of purpose-built bombers. Provision was made for two additional MG 15s to be mounted in beam positions, one weapon each to the port and starboard sides.

Junkers built the Ju 52/3m g6e in parallel to the Ju 52/3m g5e variant. The g6e was nearly identical to the previous variant, but had simplified radio equipment and was intended solely for land operations. No provisions for floats were made to the newer aircraft. Production of both the Ju 52/3m g5e and Ju 52/3m g6e ended in 1941.

## Ju 52/3m g3e



## Ju 52/3m g5e

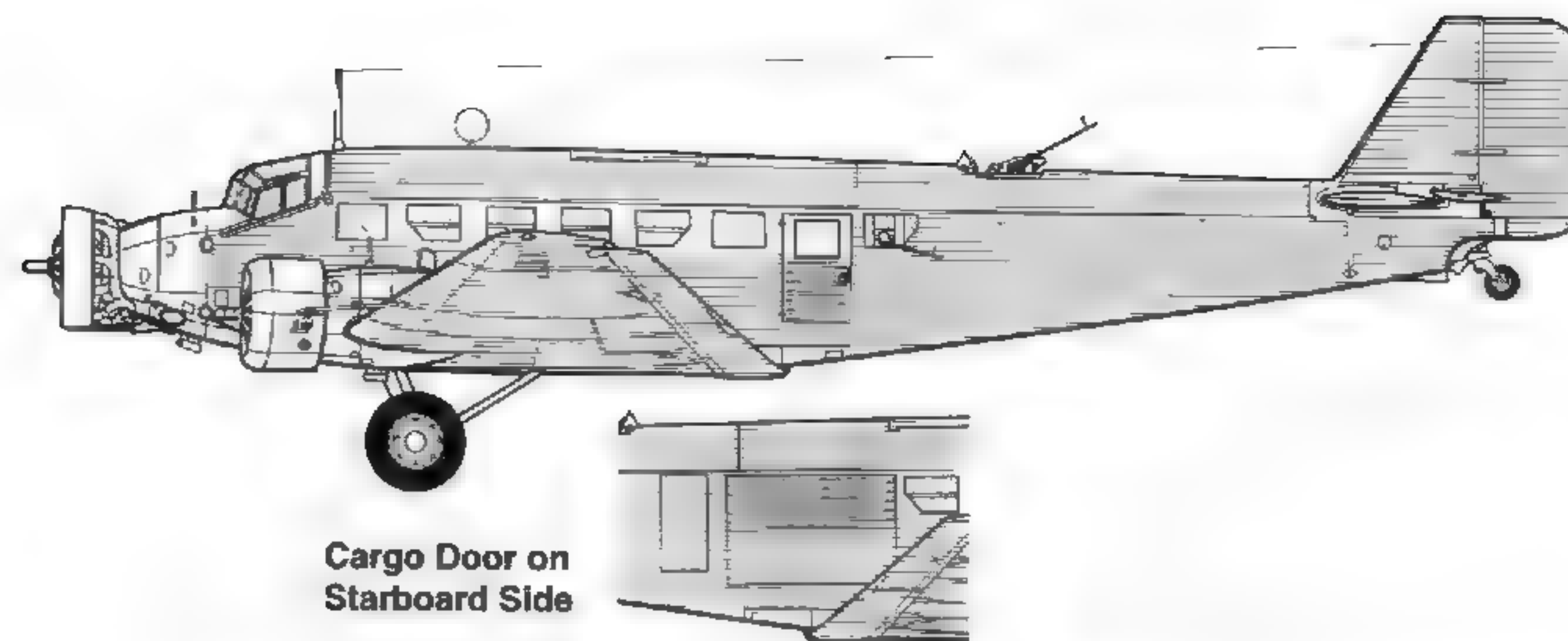
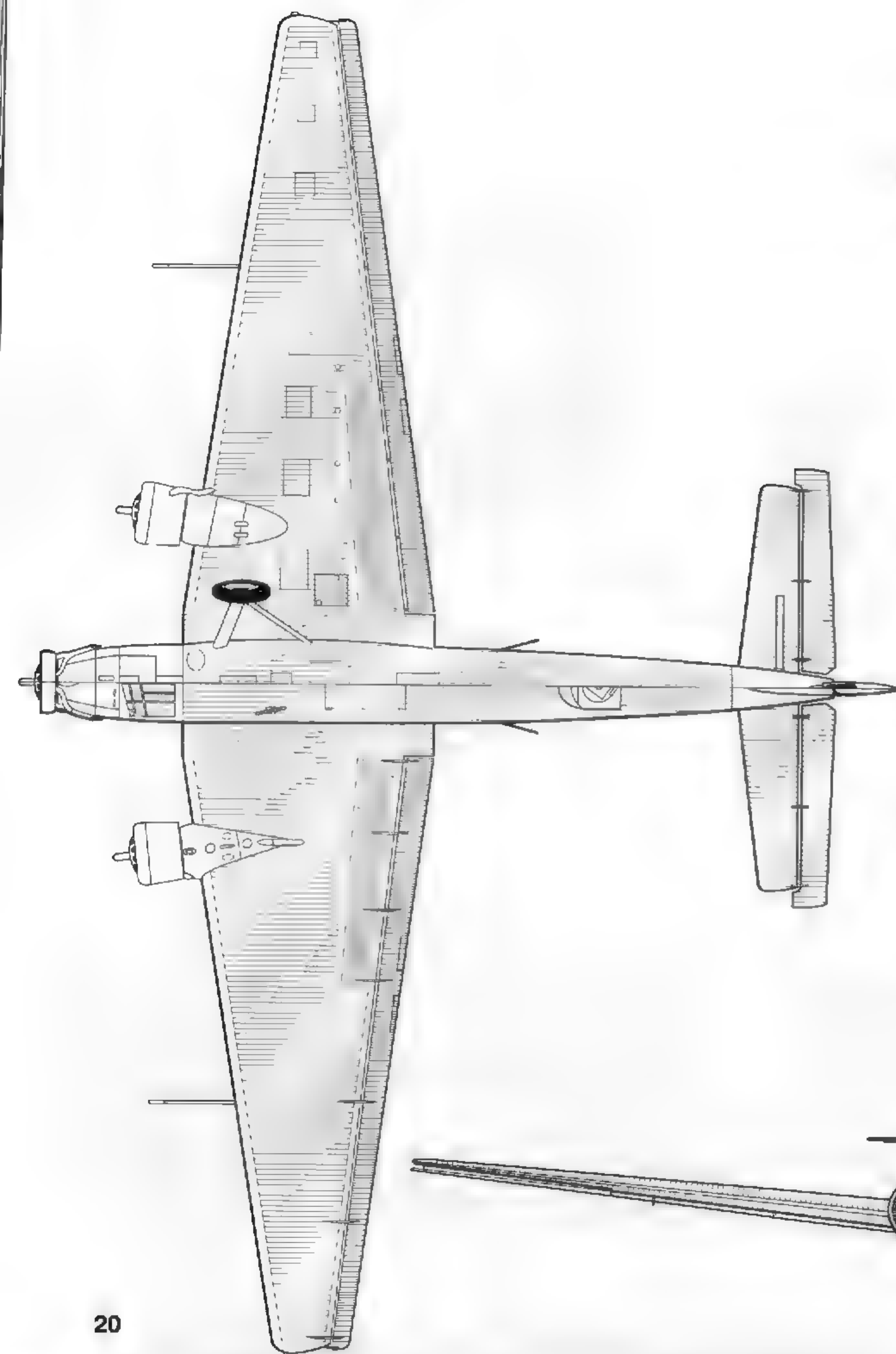


A Ju 52/3m g5e assigned to TG 3 (*Transportgeschwader*, Transport Wing) flies low over the Mediterranean Sea. This variant deleted the main wheel fairings used on earlier variants, which were easily clogged by mud and snow. A cabin ventilation inlet was mounted atop the mid-fuselage for North Africa operations. Axis aircraft assigned to the Mediterranean Theater had white aft fuselage bands. (Ernö Nagy)

Ground crewmen load metal fuel drums onto a Ju 52/3m g5e prior to a supply flight from Sicily. The Junkers transports ferried supplies across the Mediterranean to German forces in North Africa. The g5e and the previous g4e variant added a window aft of the cargo door. This window had a provision for a 7.92mm MG 15 machine gun. (Manfred Griehl)







Cargo Door on  
Starboard Side

## Junkers Ju 52/3m g5e Specifications

**Wingspan:**.....29.3 m (96 feet 1.6 inches)

**Length:**.....18.9 m (62 feet)

**Height:**.....6.1 m (20 feet)

**Empty Weight:**.....5515 kg (12,158.3 pounds)

**Maximum Weight:**..10,500 kg (23,148.1 pounds)

**Powerplant:**.....Three 830 HP BMW 132T-2 nine-cylinder, air-cooled, radial engines.

**Armament:**.....One 7.92mm MG 15 machine gun with 1050 rounds in dorsal position. Some aircraft equipped with two MG 15s firing out port and starboard beam positions.

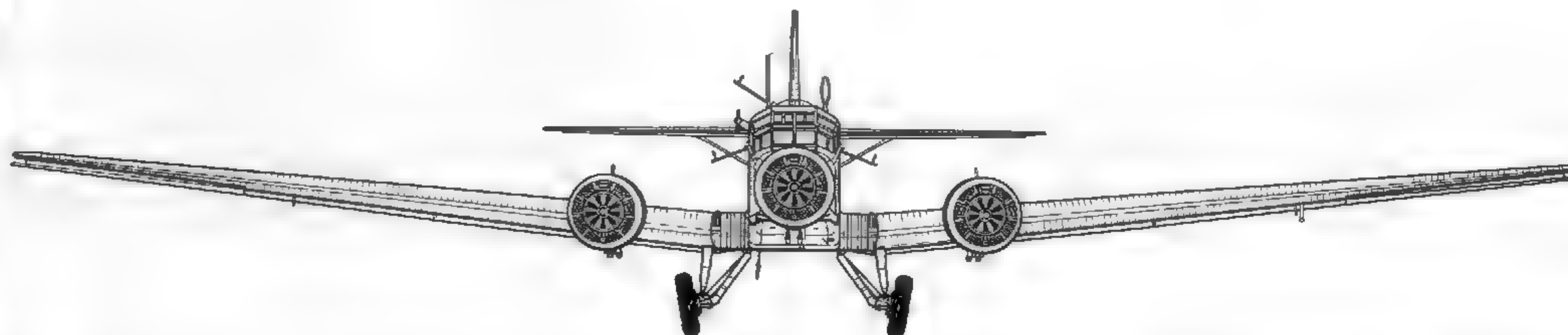
### Performance:

**Maximum Speed:**..305 kmh (189.5 mph)

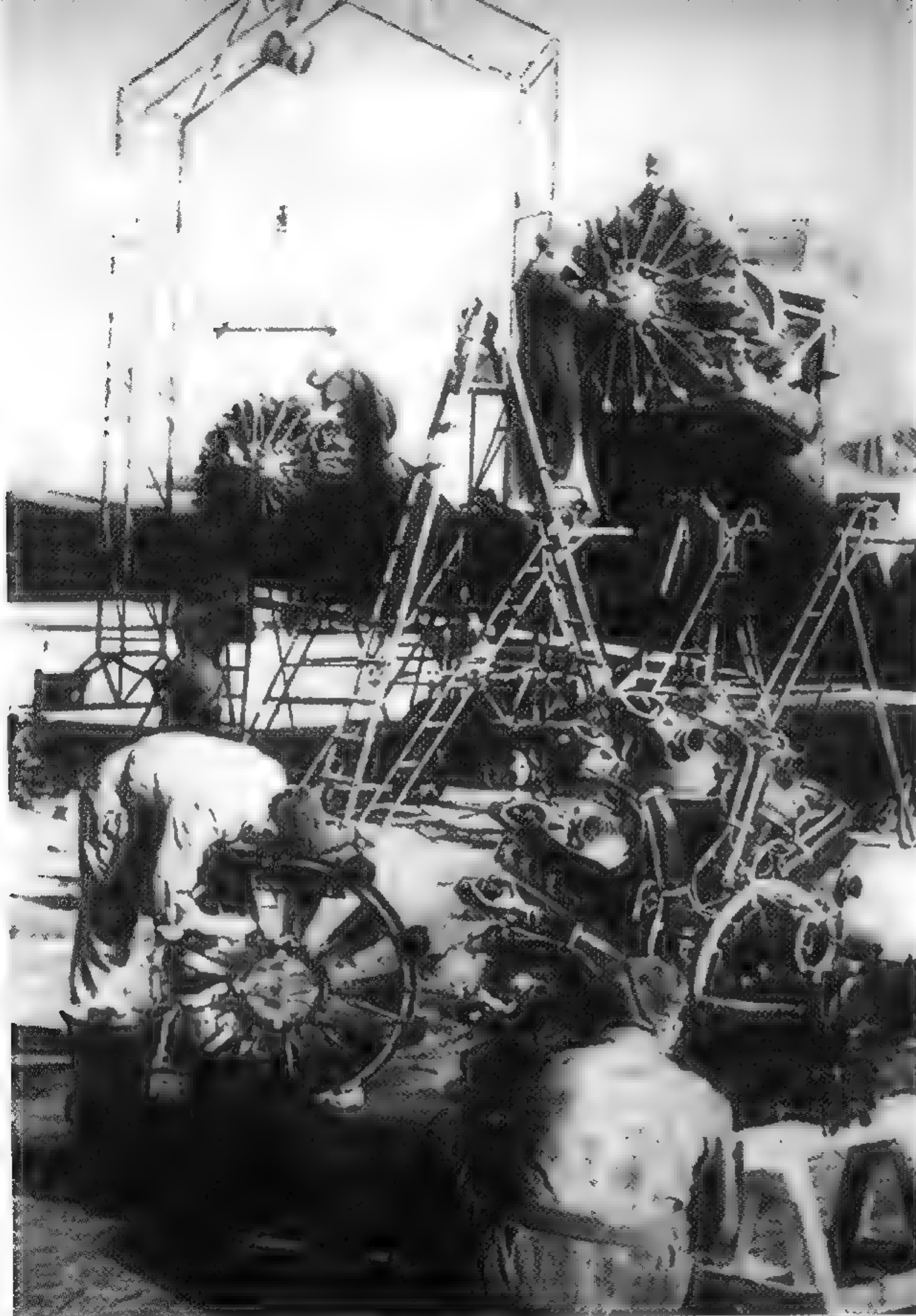
**Service Ceiling:**....5500 m (18,044.6 feet)

**Range:**.....1300 km (807.8 miles)

**Crew:**.....Five







Technicians change the BMW 132 radial engines on a Ju 52/3m at a Luftwaffe frontline airfield. The nine-cylinder BMW 132 was derived from Pratt & Whitney Hornet engines sold to Germany in the early 1930s. A gantry-mounted hoist was placed near the starboard nacelle to lower the engine to the ground. A mechanic in the foreground cleans an engine cover, whose louvers directed cooling air onto the engine cylinders.



Two German mechanics use improvised servicing platforms to work on a Ju 52/3m's center engine. The Townend ring and the engine cover were removed for maintenance. Ju 52/3ms were equipped with Junkers two-bladed, adjustable pitch metal propellers. Power ratings on BMW 132 engines increased from the 725 HP 132A-3 of the Ju 52/3m g3e to the 830 HP 132L of the Ju 52/3m g14e.



# Ju 52/3m g7e to g12e

In 1941, Junkers incorporated several improvements into the standard Ju 52/3m g5e to produce the Ju 52/3m g7e. The starboard cargo loading hatch was enlarged to enable the loading and unloading of bulkier items. The roof hatch was deleted from this variant. A Siemens K4ü autopilot was also installed to ease the pilots' workload on long flights. This variant introduced an extension aft of the center engine cowling's upper section. This extension was incorporated into subsequent Ju 52/3ms.

The Ju 52/3m g7e had wingspan of 29.3 m (96 feet 1.6 inches), a length of 18.9 m (62 feet), and a height of 6.1 m (20 feet). It weighed 6500 kg (14,329.8 pounds) empty and 11,000 kg (24,250.4 pounds) fully loaded. This variant was powered by three 830 HP BMW 132T nine-cylinder, air-cooled, radial engines, each turning a two-bladed Junkers metal propeller. The pitot tube mounted on the port wing leading edge was changed from one having a curved front end to a straight tube.

The aircraft was armed with one 7.92mm Rheinmetall MG 15 machine gun in the open aft dorsal position. Some Ju 52/3m g7es were fitted with an unpowered *Condor-Haube* (Condor Hood) turret in the cockpit's overhead glazing, which was equipped with a 7.92mm MG 15. Two additional MG 15s could be mounted in the port and starboard beam positions for defense against side attacks.

The Ju 52/3m g7e had a maximum speed of 286 kmh (177.7 mph) at 1400 m (4593.2 feet). Its economical cruise speed was 215 kmh (133.6 mph), while its maximum continuous cruising speed was 253 kmh (157.2 mph) at 1400 m. This variant's service ceiling was 5900 m.

A Ju 52/3m g7e flies low over the Eastern Front in 1941. This aircraft is equipped with the *Condor-Haube* (Condor Hood) above the cockpit, which was armed with a 7.92mm MG 15 machine gun. This weapon was supplied with 975 rounds of ammunition. A straight pitot tube on the port wing leading edge replaced the earlier curved tube in the same position. (Szentirmay)



(19,357 feet). The Ju 52/3m g7e had a range of 1100 km (683.5 miles) on its maximum standard fuel load of 2400 L (634 gallons). It had a crew of two pilots, a radio operator, and one dorsal gunner. The aircraft carried up to 18 fully-equipped troops, 12 patients on stretchers, or 1845 kg (4067.5 pounds) of cargo.

The Ju 52/3m g8e joined this variant in production in 1941. The newer version was similar to the g7e, but the first g8e (*Werk Nr. 7702*) deleted the *Condor-Haube* provision. Early g8es were powered by the same 830 HP BMW 132T engines as the previous version, but most aircraft received the more powerful 850 HP BMW 132Z radial engine. During production, a 13mm Rheinmetall MG 131 weapon replaced the aft dorsal 7.92mm MG 15.

During Ju 52/3m g8e production, Junkers simplified the variant's adaptation for various semi-specialized roles through a series of seven *Standardbausätze* (Standard Conversion Sets). The operating unit's maintenance personnel used these *Standardbausätze* on their Ju 52/3ms as the situation required. A single suffix letter added to the variant's designation identified each of the sets. The Ju 52/3m g8e *Standardbausätze* designations were:

Ju 52/3m g8e(F) – *Fallschirmjäger- und Luftlandetransporter* (Paratrooper and Airlanding Transport)

Ju 52/3m g8e(H) – *Hörsaalflugzeug* (Classroom Aircraft, or Trainer)

Ju 52/3m g8e(K) – *Kistentransporter* (Crate Transport)

Ju 52/3m g8e(N) – *Nachschubtransporter* (Supply Transport)

Ju 52/3m g8e(R) – *Reiseflugzeug* (Courier Aircraft)

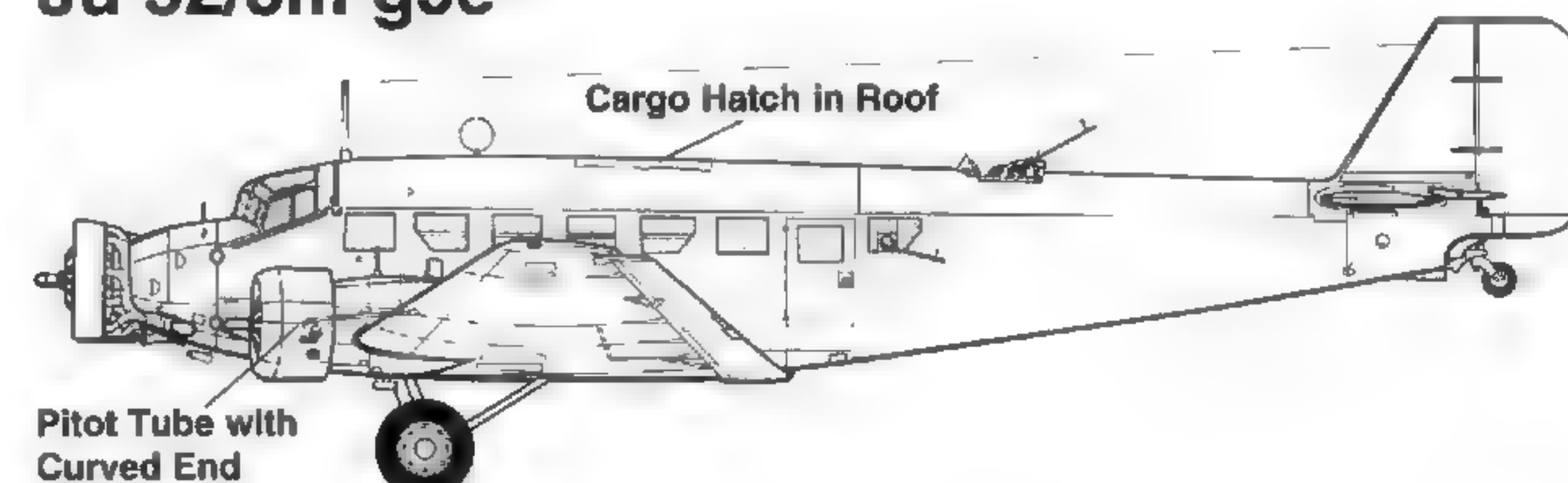
Ju 52/3m g8e(S) – *Sanitätsflugzeug* (Ambulance Aircraft)

Ju 52/3m g8e (St) – *Staffeltrupp-Transporter* (Squadron Detachment Transport)

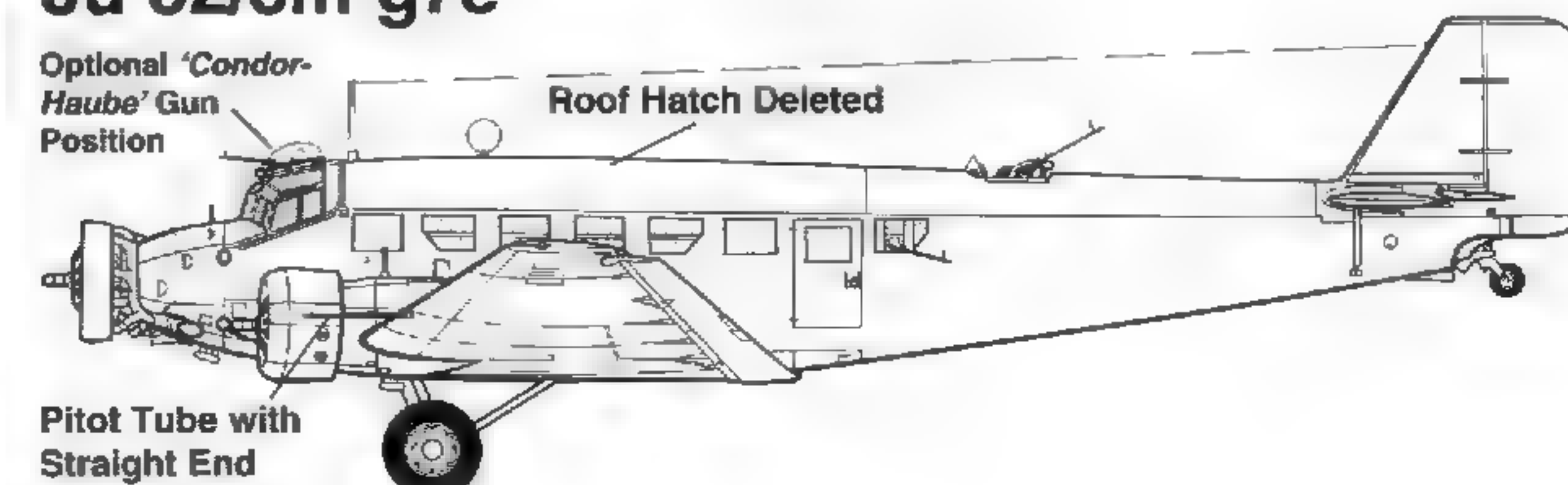
Both the Ju 52/3m g7e and g8e were produced in great numbers by both Junkers/Bernburg and by ATG/Leipzig; however, the exact total of these variants built is unknown. These were produced from 1941 until well into 1942.

The Ju 52/3m g9e was a tropicalized variant of the earlier Ju 52/3m g4e. This variant featured engine dust filters and other equipment for desert operation, along with a cabin air inlet.

## Ju 52/3m g5e



## Ju 52/3m g7e





(Right) A Ju 52/3m g7e flies over southern Europe in 1941. The temporary code B2 J is painted on the rudder. Luftwaffe transport units often used this type of code, since they were formed and dissolved on short notice for various operations. This code indicated the aircraft was the tenth aircraft (J) of the second squadron (2) of a particular transport group (B). A white band for Mediterranean operations is painted on the aft fuselage.

atop the fuselage. The Ju 52/3m g9e was also known as the Ju 52/3m g4e (trop).

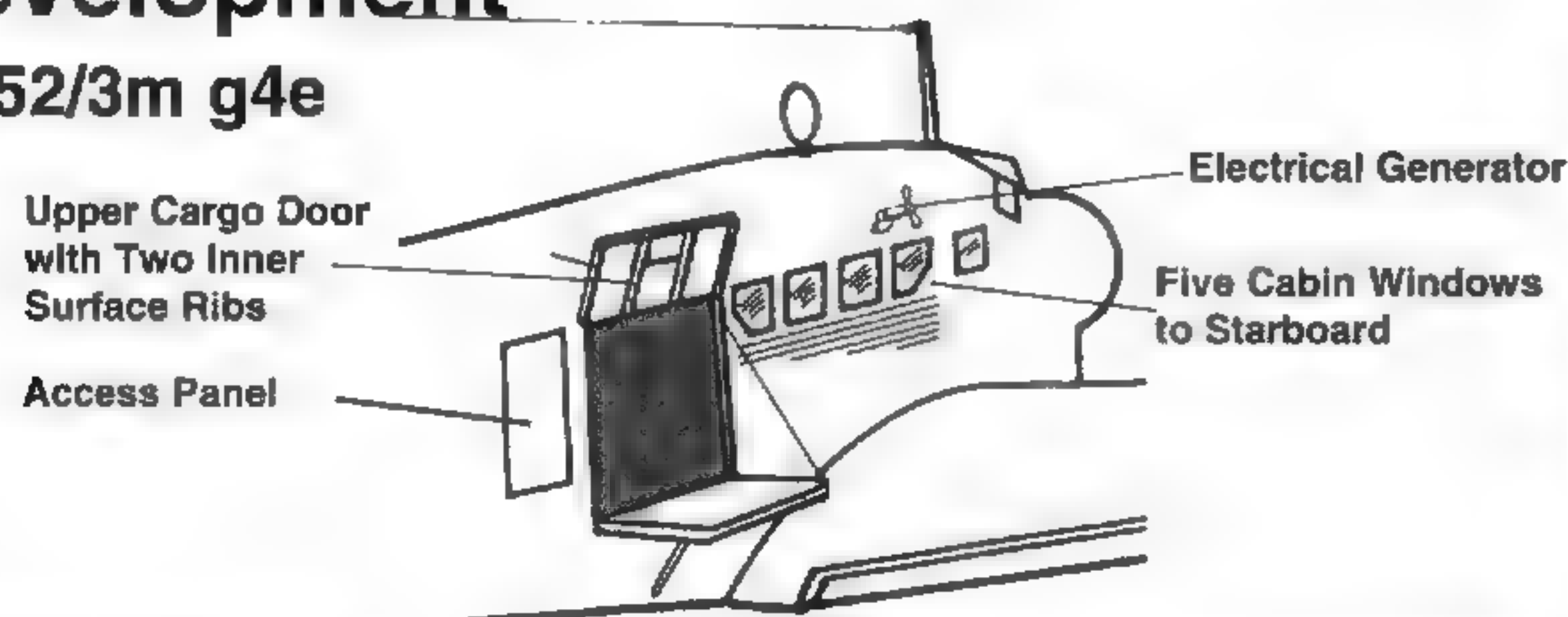
In 1942, the Ju 52/3m g10e superseded the Ju 52/3m g8e in production. This new variant reintroduced the smaller cargo door fitted to the starboard fuselage on the Ju 52/3m g4e. The narrower hatch allowed Junkers to revert to five cabin windows from the g8e's three windows. The Ju 52/3m g10e deleted the deicing system; however, the Ju 52/3m g11e reinstated the deicing equipment. The latter variant was otherwise identical to the g10e.

The Ju 52/3m g12e multi-purpose transport was built in small numbers. This variant featured armor plating to protect the flight crew. Junkers did not build the Ju 52/3m g13e due to this number's association with bad luck.

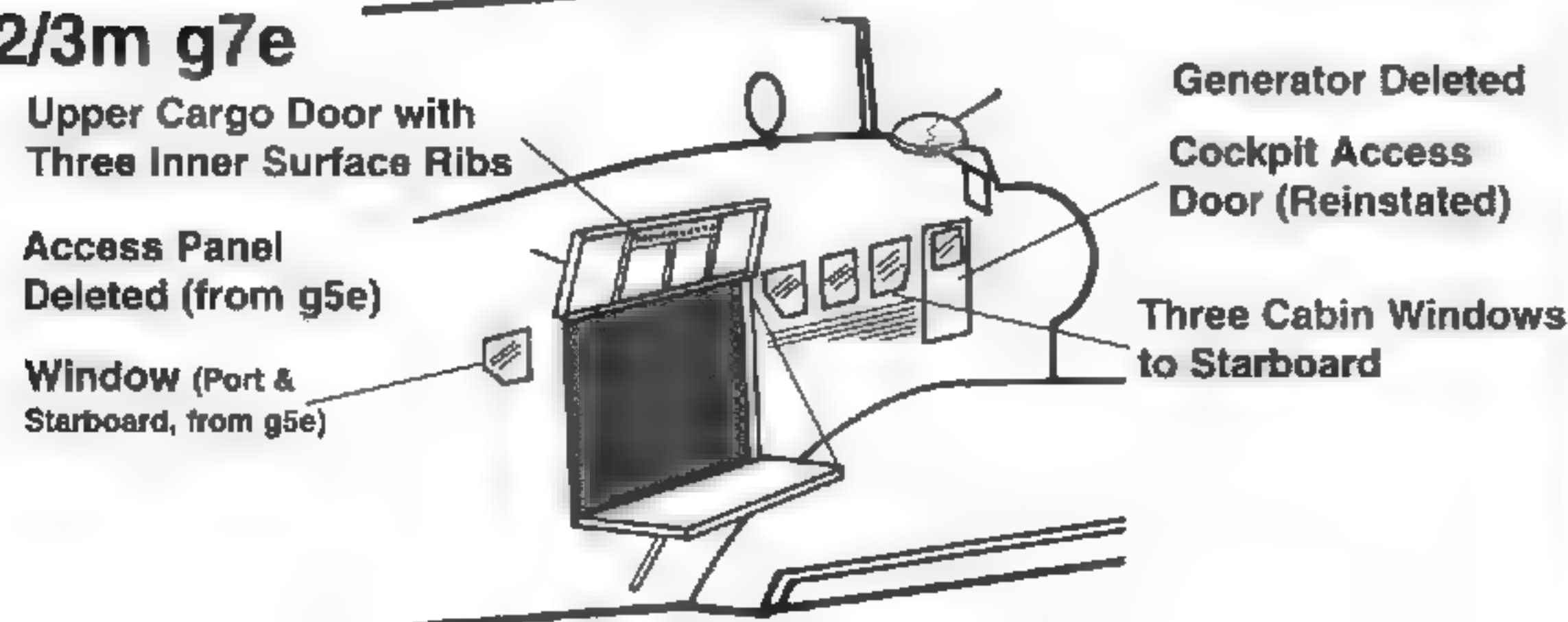


## Cargo Door and Forward Fuselage Development

### Ju 52/3m g4e



### Ju 52/3m g7e



Wounded soldiers are loaded onto a Ju 52/3m g7e on the Eastern Front during the winter of 1941-42. This variant introduced a larger two-part cargo door on the starboard side. The three starboard side windows are painted over in temporary white. A nose entrance door deleted from the Ju 52/3m g4e was returned to this variant. A 7.92mm MG 15 is mounted in the starboard waist position. (Bundesarchiv)







**Heer (Army) officers supervise the loading of a wounded soldier onto a Ju 52/3m g7e. The stretcher-bearers use the lower cargo door to help bring the patient aboard the aircraft. The upper door was raised against the upper fuselage side. A Ju 52/3m accommodated up to 12 stretchers and an attending doctor in the main cabin. Starboard side windows were reduced from five to three on this variant.**

**Several airmen assist two flight crewmen in evacuating a wounded naval officer from a Ju 52/3m g10e. The upper cargo door opened upward and folded in two. This allowed a taller, but narrower cabin opening. There were variations in the upper cargo door design. The opened hatch and the stretcher partially obscure the Red Cross on a white circle painted on the fuselage side.**

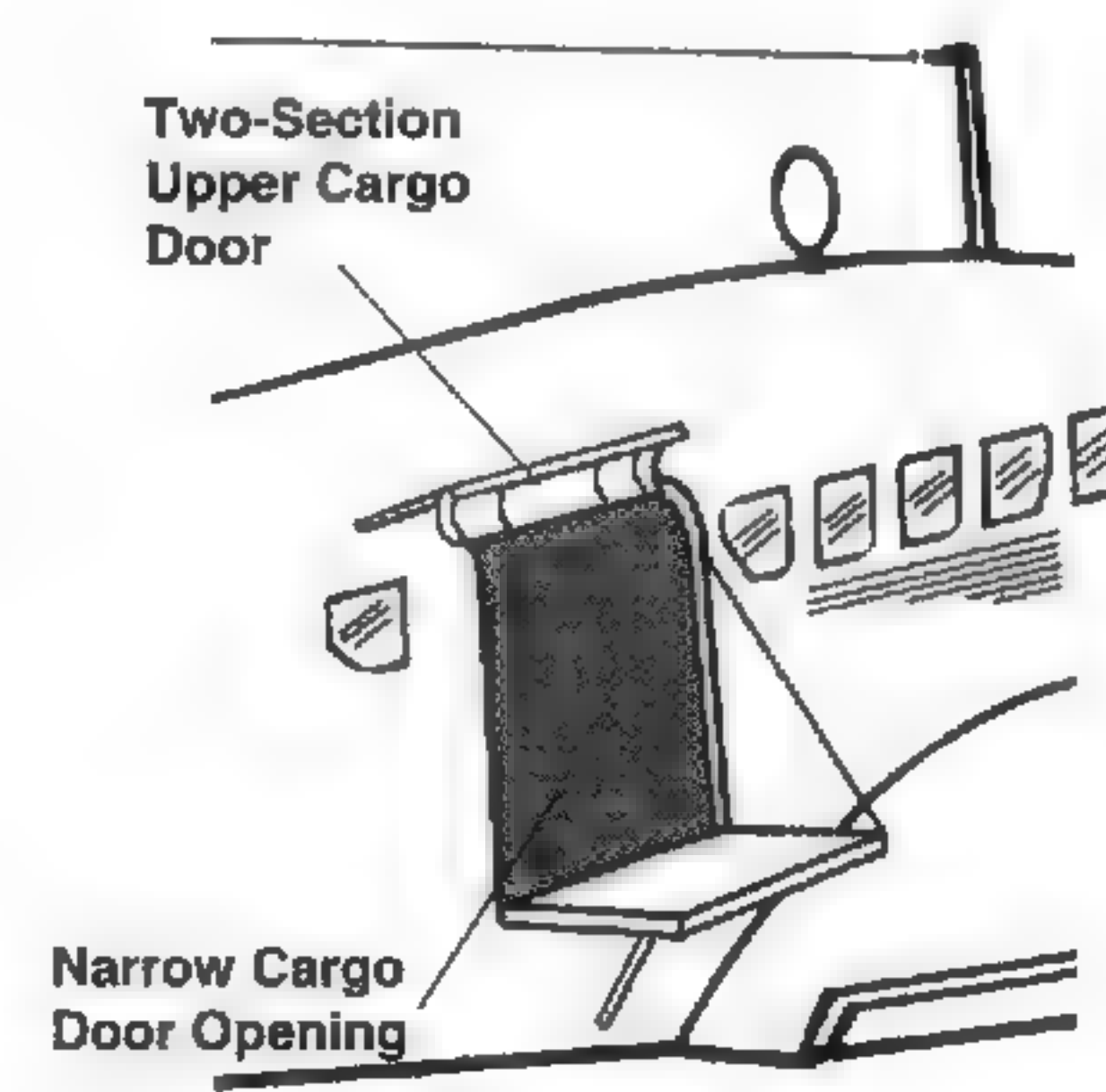
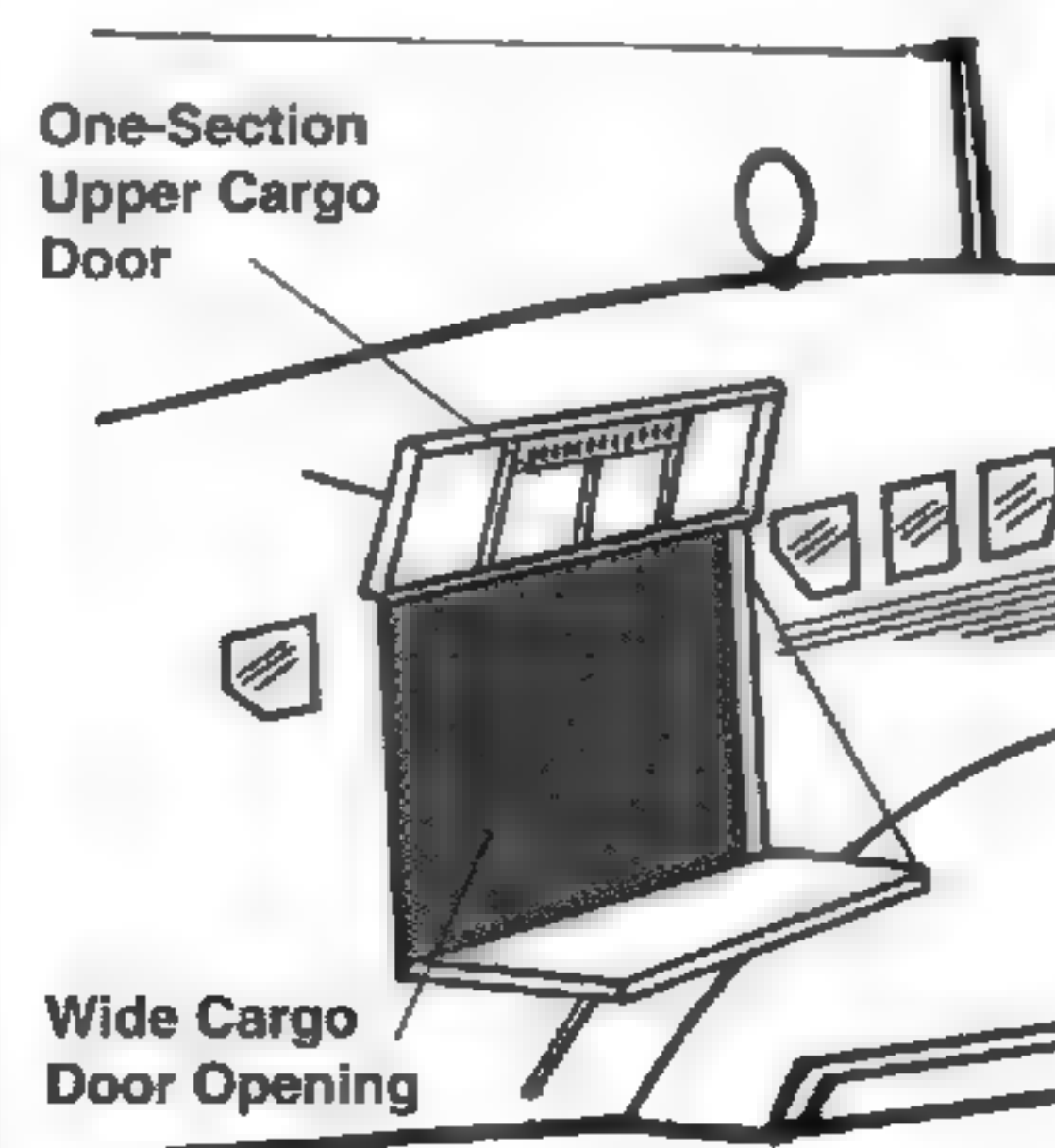


**German troops unload a Ju 52/3m g10e (NM+EH) at Poltava, Ukraine in early 1942. A white temporary finish was painted over the Black Green and Dark Green upper surface camouflage. The g10e was the first Ju 52/3m variant equipped with a three-piece cargo door. This narrower hatch allowed Junkers to return to a five-window configuration. (Molnar)**

## Cargo Door Development

**Ju 52/3m g7e and g8e  
Standard Door**

**Ju 52/3m g10e  
Modified Door**

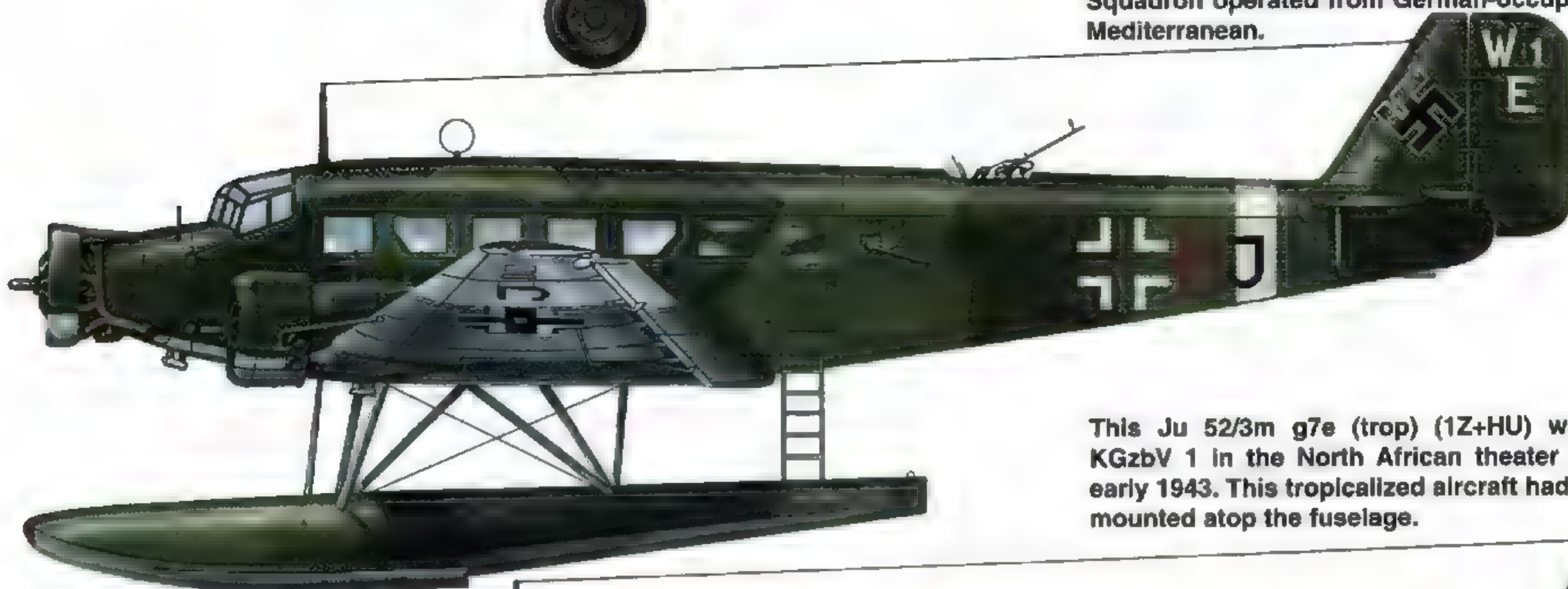




Temporary white paint was put over the upper surfaces of this Ju 52/3m g6e (BJ+YD) ambulance. The aircraft flew medical evacuation missions over the Eastern Front during the winter of 1942-43.



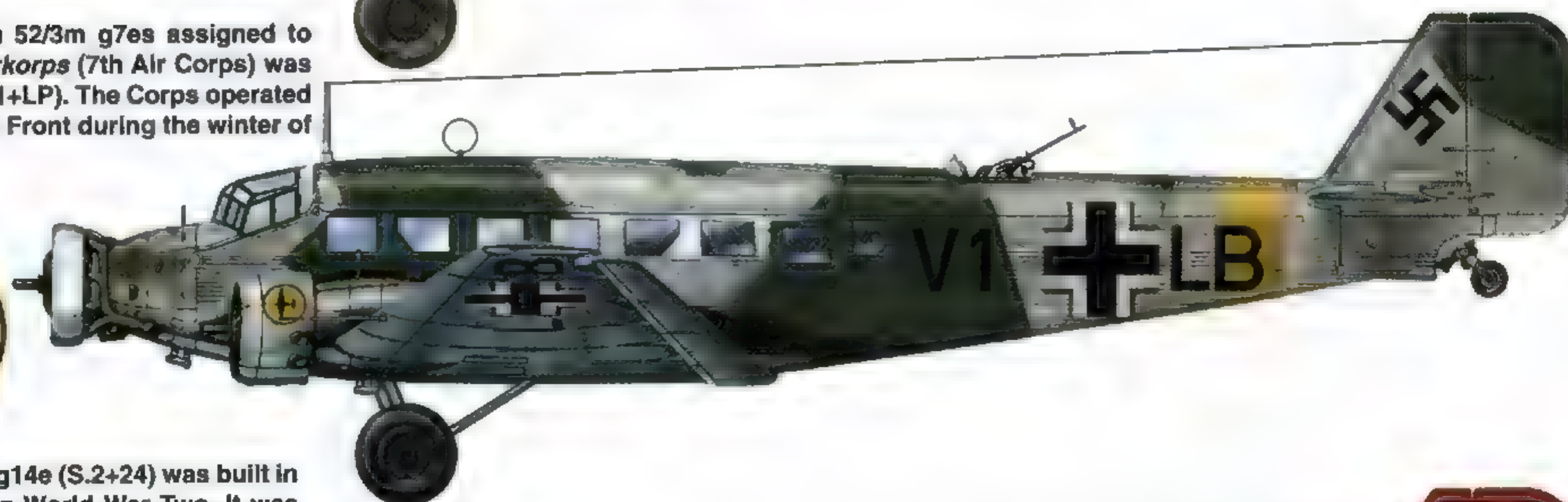
Seetransportstaffel (Sea Transport Squadron) 1 flew this Ju 52/3m g6e (See) (EJ/W1E) in November of 1943. The Squadron operated from German-occupied Crete in the Mediterranean.



This Ju 52/3m g7e (trop) (1Z+HU) was assigned to KGzbV 1 in the North African theater from 1942 until early 1943. This tropicalized aircraft had a cabin air inlet mounted atop the fuselage.



Among the Ju 52/3m g7es assigned to the VII. Fliegerkorps (7th Air Corps) was this aircraft (V1+LP). The Corps operated on the Eastern Front during the winter of 1943-44.



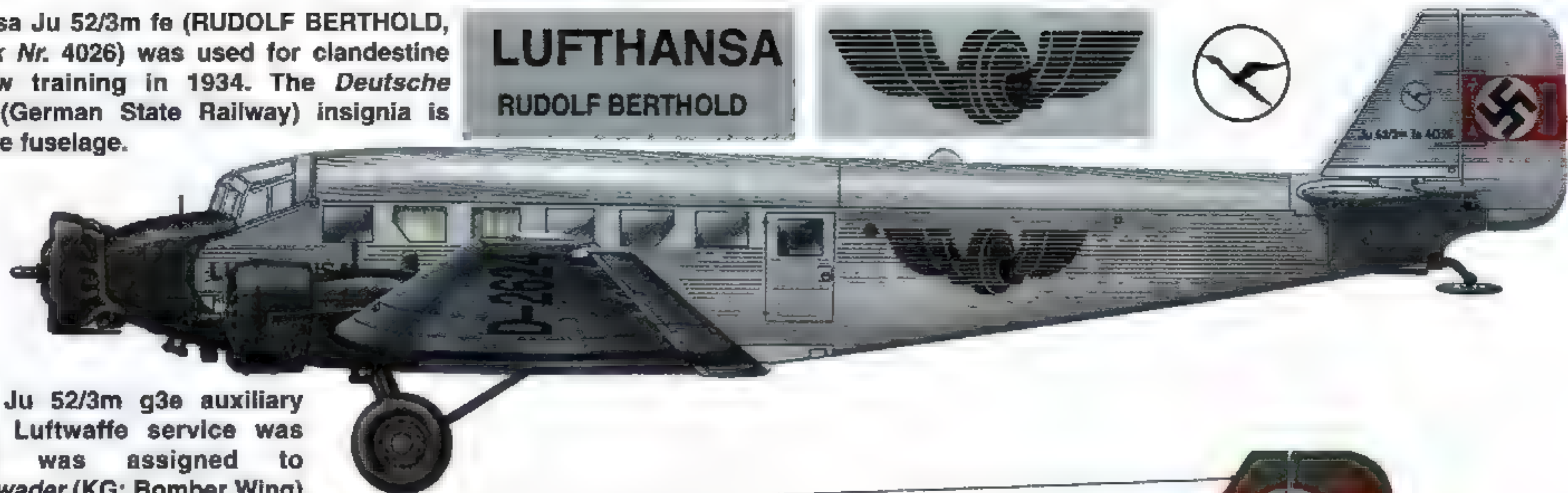
This Ju 52/3m g14e (S.2+24) was built in Hungary during World War Two. It was assigned to the 102/1 Transport Squadron, Royal Hungarian Air Force in mid-1944.





This Lufthansa Ju 52/3m fe (RUDOLF BERTHOLD, D-2624, *Werk Nr.* 4026) was used for clandestine bomber crew training in 1934. The *Deutsche Reichsbahn* (German State Railway) insignia is painted on the fuselage.

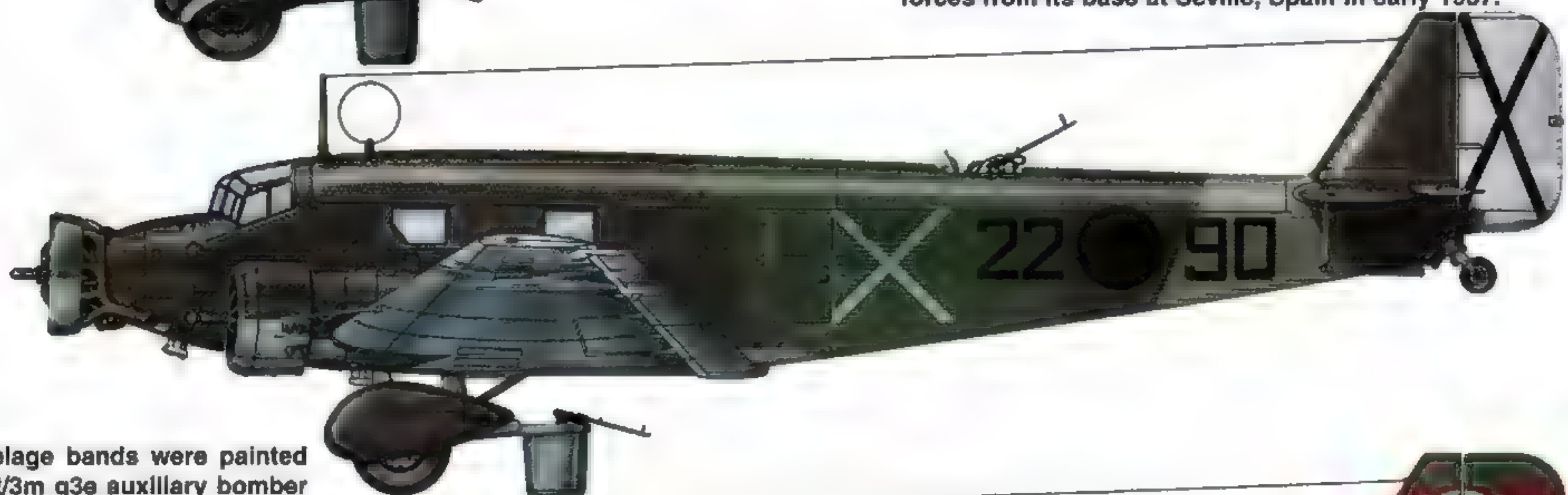
**LUFTHANSA**  
RUDOLF BERTHOLD



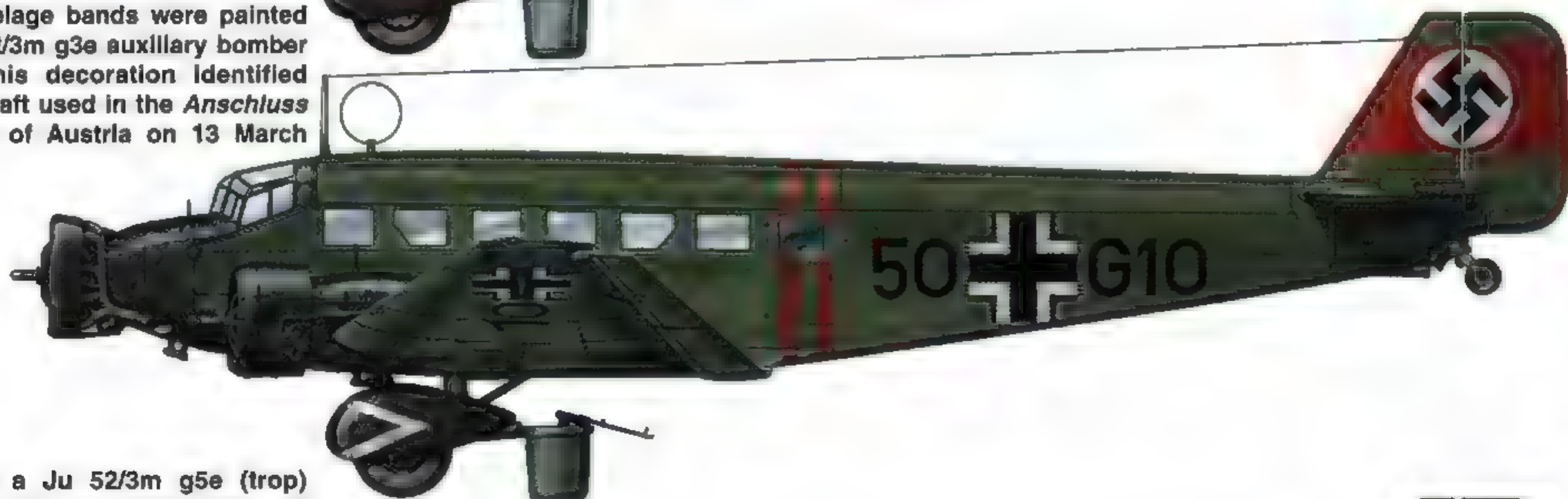
Among the Ju 52/3m g3e auxiliary bombers in Luftwaffe service was 53+F12. It was assigned to *Kampfgeschwader* (KG; Bomber Wing) 355 in 1935.



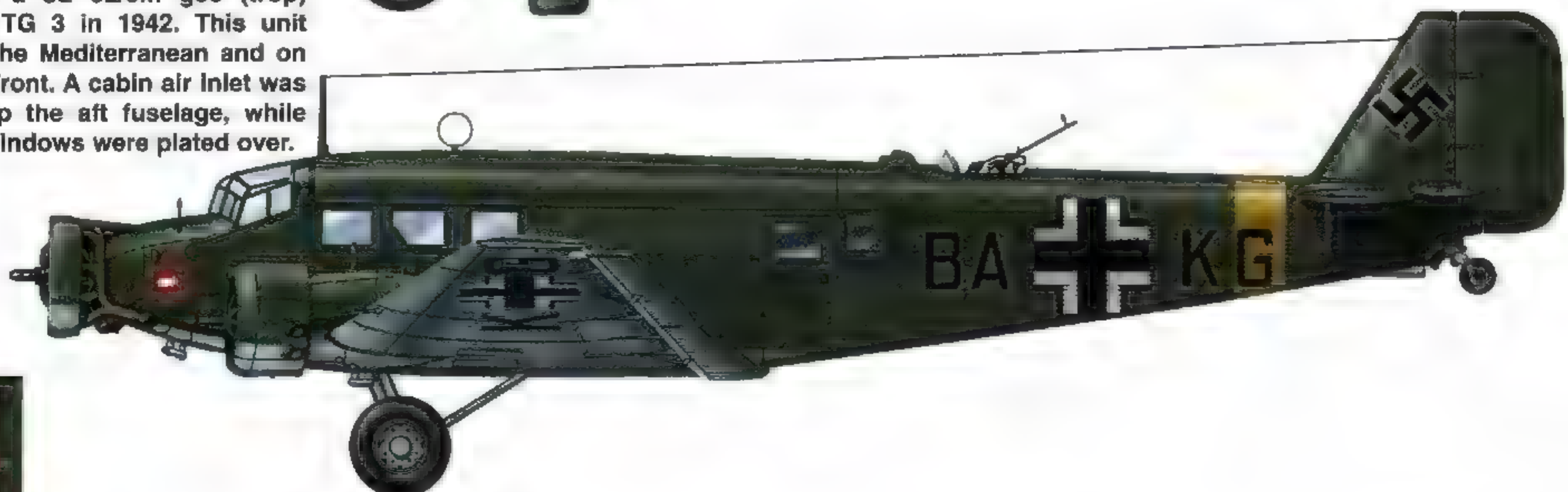
This Ju 52/3m g3e (22-90) was assigned to 1 *Staffel* (Squadron), *Kampfgruppe* (Bomber Group) 88, *Legion Condor*. This German unit aided the Spanish Nationalist forces from its base at Seville, Spain in early 1937.



Two red fuselage bands were painted on this Ju 52/3m g3e auxiliary bomber (50+G10). This decoration identified German aircraft used in the *Anschluss* (Annexation) of Austria on 13 March 1938.



BA+KG was a Ju 52/3m g5e (trop) assigned to TG 3 in 1942. This unit operated in the Mediterranean and on the Eastern Front. A cabin air inlet was mounted atop the aft fuselage, while three cabin windows were plated over.





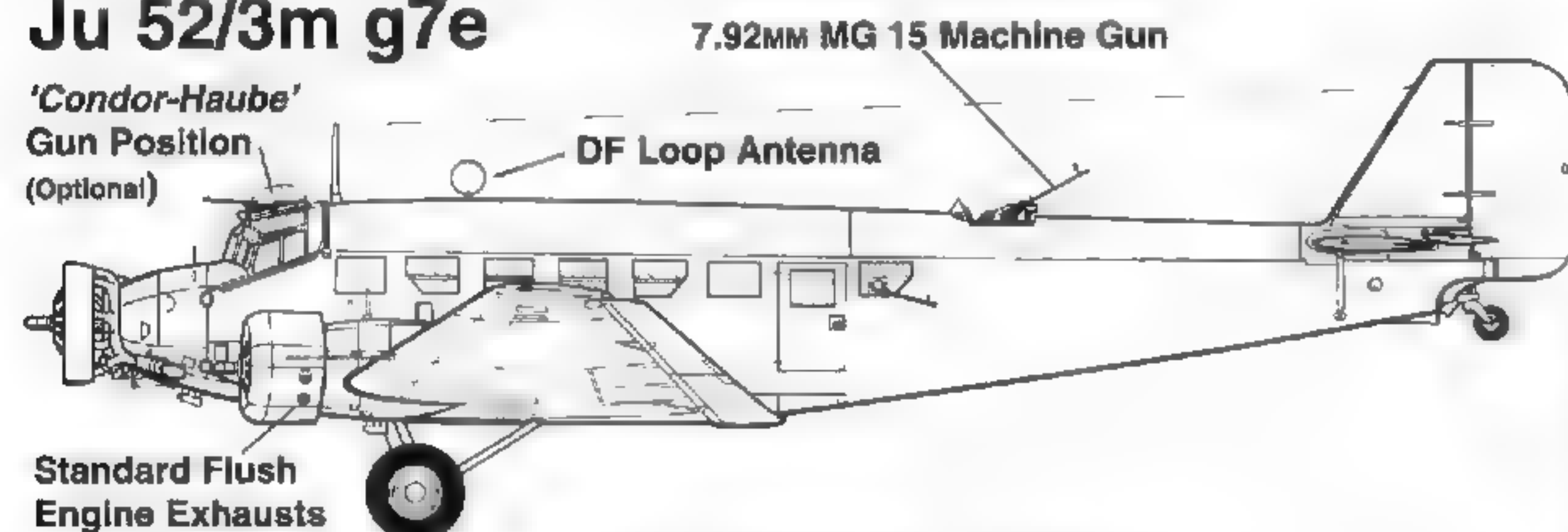
# Ju 52/3m g14e

The Ju 52/3m g14e was the last production variant of Junkers' venerable trimotor. This variant introduced armor plating around the cockpit to protect the pilot and co-pilot. It was armed with one 13MM Rheinmetall MG 131 machine gun in the open aft dorsal position and two 7.92MM Rheinmetall MG 15 machine guns in the beam positions. The *Condor-Haube* (Condor Hood) unpowered turret above the cockpit was deleted. The Ju 52/3m g14e entered production in the late autumn of 1943 and was built until late 1944.

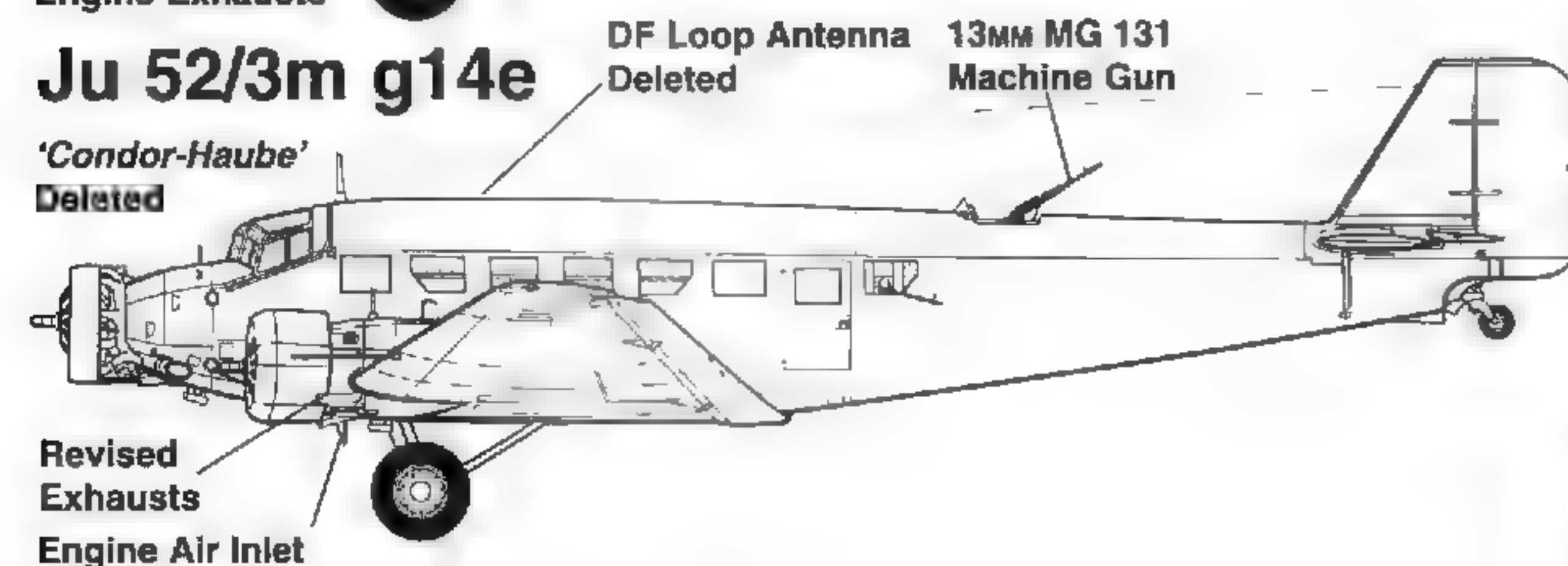
The external dimensions remained unchanged from previous Ju 52/3m variants, with the wingspan at 29.3 m (96 feet 1.6 inches). The length stayed at 18.9 m (62 feet) and the height was 6.1 m (20 feet). It weighed 5600 KG (12,345.7 pounds) empty and 11,030 KG (24,316.6 pounds) fully loaded. The Ju 52/3m g14e was powered by 830 HP BMW 132L nine-cylinder, air-cooled, radial engines turning two-bladed propellers. An inlet was added under each engine to increase air coming into the carburetor. The Ju 52/3m g14e introduced a modified exhaust configuration, which replaced the two flush exhausts in each wing engine cowling on previous variants. The g14e's upper exhaust stack was relocated behind the engine cowling and the lower exhaust was extended aft. Most g14es had a small antenna mast on the upper fuselage, but lacked a Direction Finding (DF) loop antenna. The thick main landing gear struts last standard on the g3e were reintroduced on this new variant.

Factories in Germany, Hungary, and France built 4845 Ju 52/3ms before production ended by the end of 1944. From 1943, most Ju 52/3ms were built for the Luftwaffe by Amiot at Colombes, France.

## Ju 52/3m g7e



## Ju 52/3m g14e



The Royal Romanian Air Force captured this Ju 52/3m g14e (9) from the Luftwaffe after Romania's defection to the Allies on 23 August 1944. This variant reintroduced the thicker main wheel struts previously used on Ju 52/3m g3e and g4e aircraft. This aircraft also has the anti-oil spill plate fitted immediately aft of the center engine. Two Junkers W 34s captured by the Romanians are parked off the Ju 52/3m's starboard wing. (Dan Antoniou)

Bulgarian soldiers stand in front of a captured Luftwaffe Ju 52/3m g14e in the fall of 1944. Bulgaria left the Axis to join the Allies in September of that year. The Ju 52/3m g14e introduced an inlet under each engine and enlarged exhausts on the wing BMW 132L engines. (Stephan Boshniakov)





## Ju 52/3m See

Ju 52/3ms equipped with floats for water-based operations were designated the **Ju 52/3m See** (Sea). The tailwheel was removed and the main landing gear replaced by two floats. Junkers-designed metal floats with a displacement of 9500 L (2509.6 gallons) of water were originally fitted, but larger Heinkel floats soon replaced these. The latter items were 11.34 m (37 feet 2.4 inches) long and displaced 11,000 L (2905.9 gallons). Four V-shaped struts attached each float to the wing undersurface, with wire bracing providing additional support.

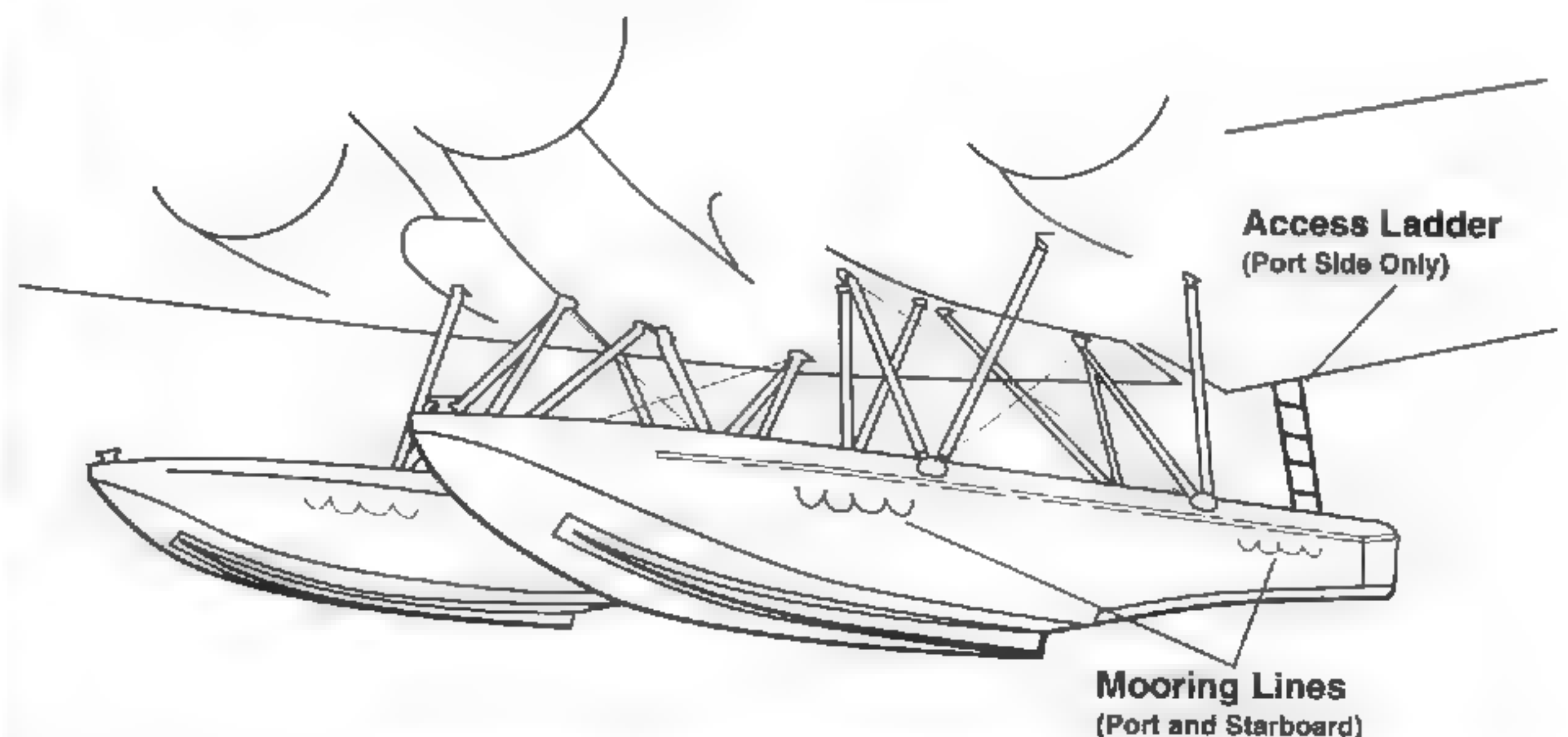
An access ladder connected the rear entrance door to the port float's upper rear section; no ladder was mounted on the starboard side. Handhold rails were mounted under the windows on both sides of the floatplane variants. These rails were retained on those Ju 52/3m *See* aircraft converted to land operation.

Several Ju 52/3m g4e (*See*) floatplanes were assigned to KGrzbV 108 *See*<sup>1</sup> in early 1940. These aircraft were employed in Germany's invasion of Denmark and Norway on 9 April 1940. The Junkers floatplanes delivered troops and supplies to islands and fjords, which were otherwise inaccessible to the German forces. Ju 52/3m (*See*) aircraft were deployed to Norway and the Mediterranean and served throughout World War Two.

The Ju 52/3m g8e (*See*)'s gross weight on floats was 11,500 kg (25,352.7 pounds). This was 500 kg (1102.3 pounds) heavier than the 11,000 kg (24,250.4 pounds) maximum weight of a Ju 52/3m g8e landplane and this was due to the twin floats. The g8e (*See*) had a water take off run of 845 m (2772.3 feet), which was accomplished in 53 seconds during the type's evaluation trials. This variant reached 3000 m (9842.5 feet) altitude in 21 minutes and reached a maximum speed of 231 kmh (143.5 mph). The floatplane's top speed was 55 kmh (34.2 mph) slower than the comparable landplane's 286 kmh (177.7 mph) maximum, due to aerodynamic drag from the twin floats and their struts. The floatplane's cruising speed at low altitude was 173 kmh (107.5 mph), compared to 215 kmh (133.6 mph) for the Ju 52/3m g8e landplane.

<sup>1</sup>KGrzbV – *Kampfgruppe zur besonderen Verwendung* (Bomber Group for Special Duties). This was the Luftwaffe's designation for a Transport Group before 15 May 1943. On that date, these groups were redesignated *Transportgruppen* (TGr).

## Floats for Ju 52/3m See



A Ju 52/3m g5e (*See*) assigned to STSt 1 (*Seetransportstaffel*; Sea Transport Squadron) flies off Crete in 1941. The temporary white code W1 E is painted on the rudder, while a white Mediterranean Theater band appears on the aft fuselage. Ju 52/3m (*See*) floatplanes were equipped with an access ladder only on the port side. (Bundesarchiv)

This Ju 52/3m (*See*) taxis in to its base after a maritime transport mission. The Eastern Front markings of RLM 04 Yellow (FS33538) undersurface wingtips and aft fuselage band are painted on this aircraft. The white letter J aft of the fuselage cross was its *Staffel* (Squadron) individual aircraft code. (Bundesarchiv)







A large crane prepares to hoist a Ju 52/3m g6e (See) from the water. All float equipped Ju 52s were fitted with handrails along both fuselage sides, under the windows. Heinkel manufactured the floats and their strut assemblies under contract from Junkers for the Ju 52/3m (See). (Bundesarchiv)

Aircraft handlers in a motorboat circle a Ju 52/3m (See) floatplane. The crewmen are inspecting the aircraft and the surrounding water for any problems before the aircraft takes off. White J has its Eastern Front yellow band around the fuselage *Balkenkreuz* (Beam Cross) national insignia.



A Ju 52/3m (See)'s crew – two pilots, radio operator, and two gunners – perch on or near its starboard float. One of the crewmen stands beside a wreath on the wing, which is believed to commemorate their unit's 500th mission. Each float is attached to the Ju 52/3m's wing by fore-and-aft N-shaped struts and a central V-shaped strut. The starboard access door is fully opened. Landing lines are attached to the float's outboard side forward of the front strut attachment point and aft of the aft attachment point. A handrail is mounted along the fuselage side under the cabin windows.



# Junkers Ju 52/3m MS

Junkers converted several Ju 52/3m g4e through g7e aircraft into mine sweeping aircraft, which were redesignated as **Ju 52/3m MS** (*Minensuch*; Mine Search). A 14 m (45 feet 11.2 inch) diameter duralumin Gauss ring was mounted on struts under the wings and fuselage. This hoop was energized by a 270 ampere electrical generator, which was powered by a 55 HP Mercedes Nürburg eight-cylinder, liquid-cooled, inline engine. This engine was mounted in the forward fuselage and was cooled through a radiator installed immediately in front of the main landing gear struts. The mine sweeping equipment weighed 1136 KG (2504.4 pounds). Two inlets – identical to those fitted to the Ju 52/3m ge airliner – were added atop the fuselage, one each forward and aft. These inlets brought extra cooling air into the cabin while the generator was operating. Several Ju 52/3m MS aircraft were equipped with variable pitch propellers.

The first Ju 52/3m MS missions were flown off the coast of Holland in September of 1940. The aircraft usually flew 50 m (164 feet) over the water, while electrical energy in the Gauss ring created a magnetic field. This field was sufficient to detonate magnetic mines dropped by British Royal Air Force (RAF) aircraft off the coast of German-occupied Europe.

The Ju 52/3m (MS) aircraft were deployed to airfields along the coasts of the Atlantic Ocean and the North, Adriatic, and Baltic Seas. The Luftwaffe assigned 74 of these aircraft to the *Minensuchgruppe* (Mine Search Group) in November of 1943. Six of the Group's Ju 52/3m (MS) aircraft were deployed to Hungary in April of 1944. These aircraft conducted mine sweeping missions over the Danube River after the RAF dropped magnetic mines into the waterway. Most remaining Ju 52/3m (MS) aircraft were grounded due to lack of fuel by the beginning of 1945.

This MSGr 1 Ju 52/3m MS (PD+KH) taxis at Budaörs airfield near Budapest, Hungary during the summer of 1944. The Germans deployed six minesweeping aircraft to Hungary to detect and destroy British mines laid in the Danube River. This aircraft was converted from a Ju 52/3m g7e transport, which retained its large cargo door. Unusually, the Ju 52/3m MS has wheel spats, which were not normally found on these aircraft. (Punka Archiv)



This Ju 52/3m MS (TH+UC) was assigned to 4 *Staffel*, MSGr 1 (*Minensuchgruppe*; Mine Search Group) in Italy. The unit flew anti-mine patrols over the Adriatic Sea. This aircraft was converted from a Ju 52/3m g7e and had a cabin ventilation inlet added to the upper forward fuselage. The inlet was a typical feature on Ju 52/3m MS aircraft. An additional inlet is mounted on the aft upper fuselage, but is hidden by the wing in this view. (Carlo Lucchini)

A Ju 52/3m MS flies low over Italy during a mine search mission. A 14 m (45 feet 11.2 inch) diameter ring was mounted under the wings and fuselage. This ring was charged with electricity while the aircraft flew 50 m (164 feet) above the water. The resulting magnetic field was used to detonate magnetic mines the Allies laid in coastal waters and rivers.





# Ju 52/3m Non Version Related Features

The Ju 52/3m was often modified for specific duties or for specific theaters of operation during its operational service. These modifications were not related to any specific variant, but were found in several Ju 52/3m variants.

One such feature was the upper center engine covering, which was first introduced on the Ju 52/3m reo civil high altitude variant. This covering was adopted on Ju 52/3m g3es and used on all subsequent military variants. The covering prevented engine oil from streaming onto the windshield.

Improved cabin ventilation was added to Ju 52/3ms operating in North Africa and on ambulance duties on all fronts. The Ju 52/3m (trop) developed for North African operations had tube-shaped inlets mounted on the central upper fuselage. This was similar in appearance to the inlet fitted to civil Ju 52/3ms. Several of these aircraft also had a cockpit ventilation inlet added immediately in front of the upper gun position. The ambulance versions had wider inlet scoops fitted to the upper fuselage.

Most Luftwaffe Ju 52/3ms had two oil coolers mounted under each BMW 132 radial engine; however, several aircraft were fitted with three oil coolers. Rear view mirrors were fitted to a number of Ju 52/3ms in the field. Some aircraft had their mirrors located atop the canopy framing, while others had them mounted on both sides of the canopy.

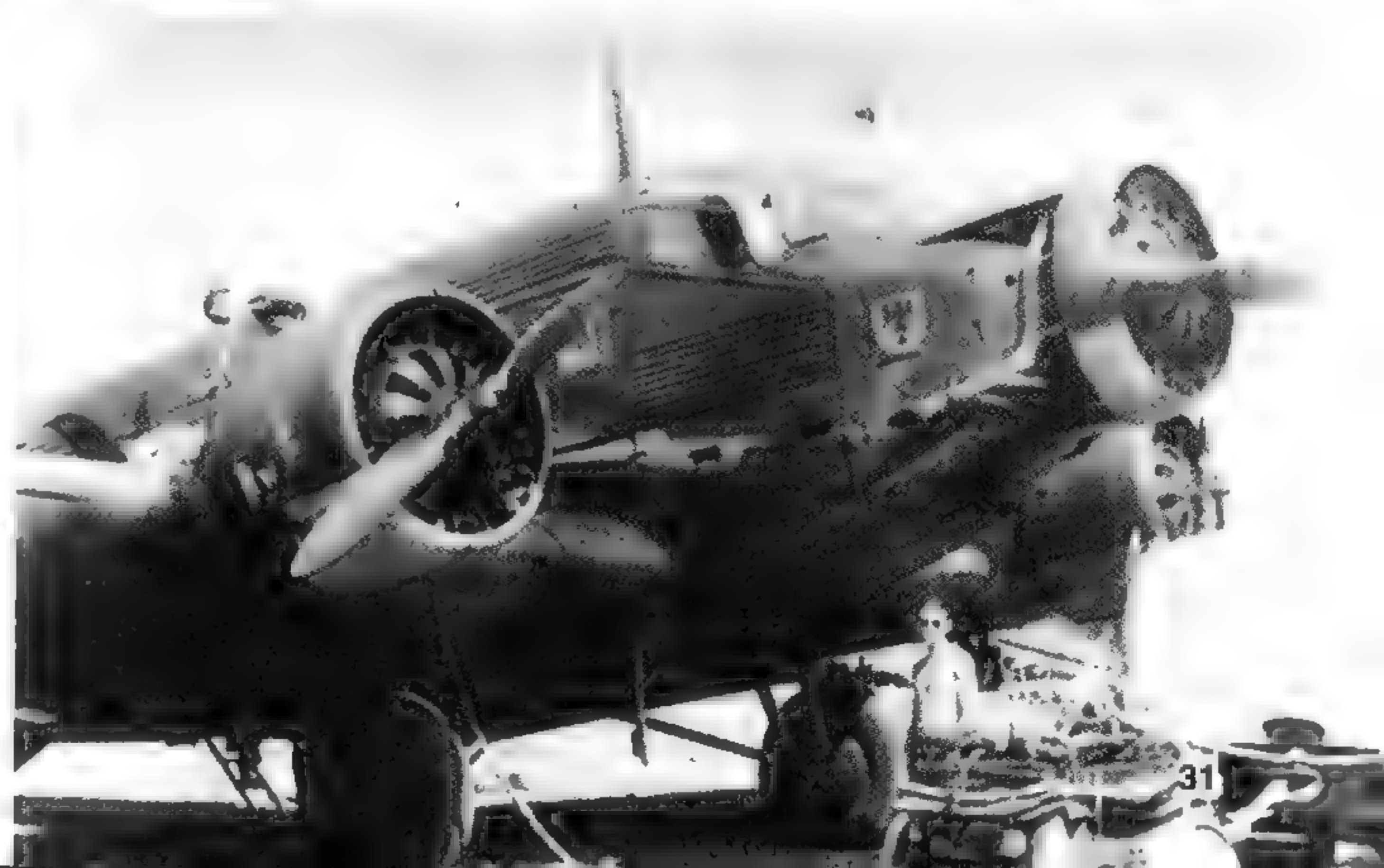
Luftwaffe field depots modified several Ju 52/3m g3es and g4es with beam (waist) gun positions, called the *D-Stand*. Each position on the port and starboard fuselage sides was armed with one 7.92MM MG 15 machine gun. A number of Ju 52/3ms on the Eastern Front fitted Plexiglas hoods over the aft dorsal gunner's position. This hood was adopted from the one used on the Heinkel He 111 bomber and protected the gunner from the harsh winter conditions in Russia.

A Ju 52/3m g7e offloads ammunition crates at a German airfield in the occupied Soviet Union. An MG 15 machine gun is mounted immediately aft of the open cargo door. This aircraft is fitted with an anti-oil spill plate on this aircraft's center engine. Some of these plates had aft-facing vents, while others lacked the vents. (Bundesarchiv)



This Ju 52/3m g7e in Russia is fitted with a plate over the center engine's exhausts. This plate was intended to prevent engine oil from streaming onto the windshield. It was frequently installed on Ju 52/3m g7e and later variants. This aircraft is warming up its engines before a mission in 1942. (Bundesarchiv)

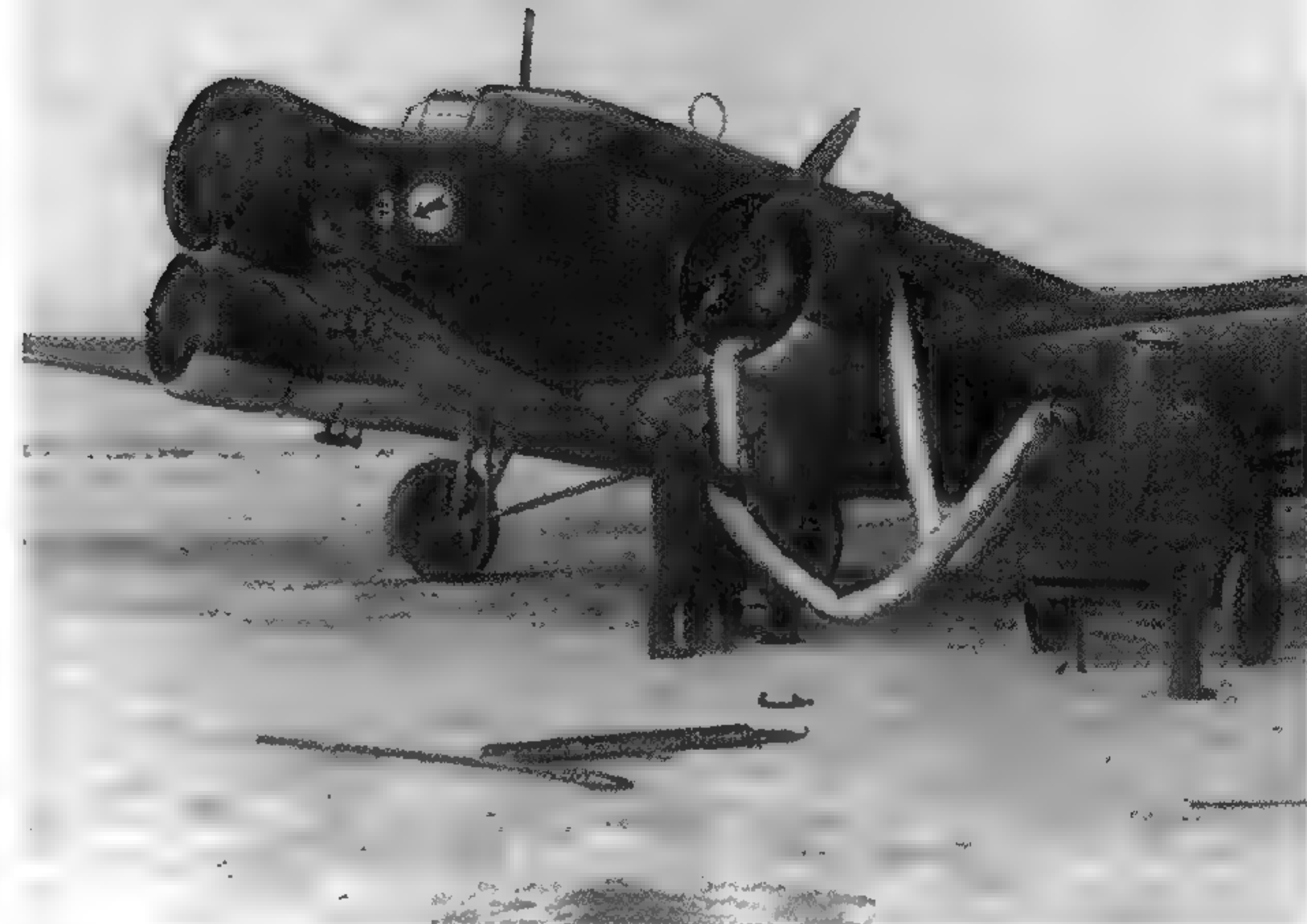
This Ju 52/3m g7e was stationed in Yugoslavia with KG 500 (*Kampfgeschwader*, Bomber Wing), whose insignia is painted on the nose. A rear view mirror is mounted on the centerline canopy frame. Several Ju 52/3ms were fitted with the mirrors, which aided the pilots in both ground taxiing and flight. A centerline engine covering plate is installed. (Bohumir Kudlicka)







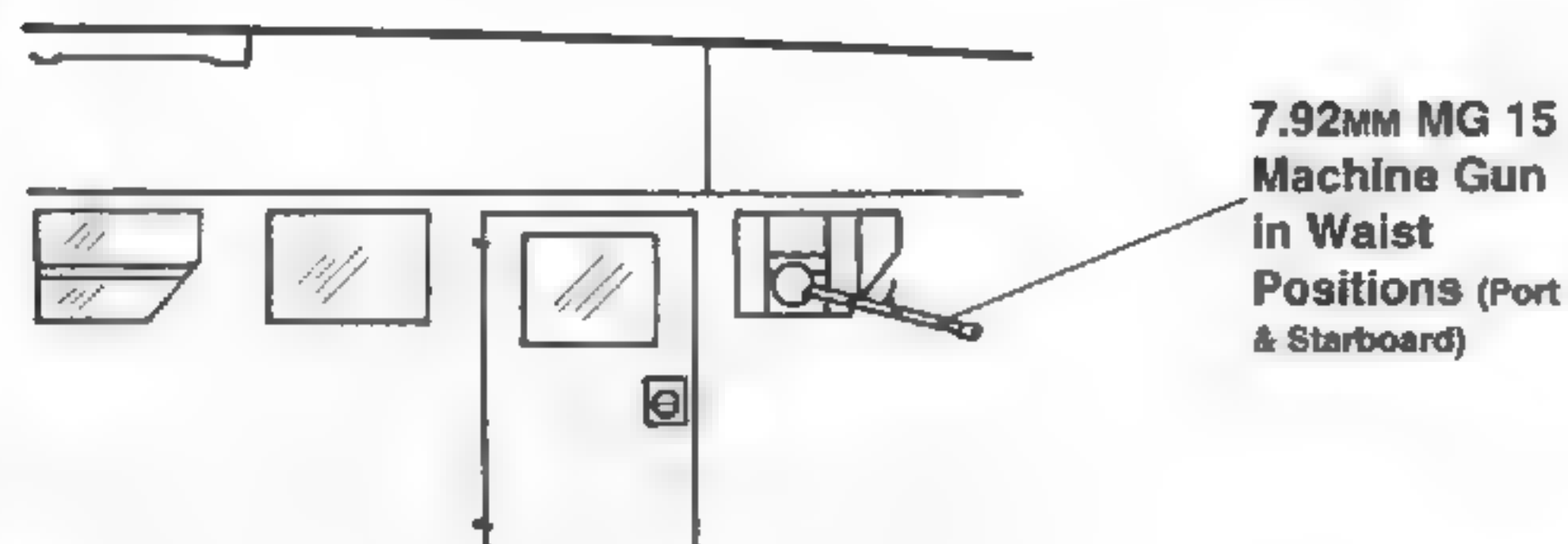
This TG 3 aircraft (BA+KG) stationed in Finland is believed to be a modified Ju 52/3m g5e. It has the three starboard side windows common to Ju 52/3m g7es, but retains the g5e's smaller cargo door. This Ju 52/3m lacks the cabin window aft of the cargo door normally found on g5e aircraft. It also has the cabin inlet usually associated with tropicalized Ju 52/3ms mounted immediately forward of the dorsal gun position. (Klaus Niska)



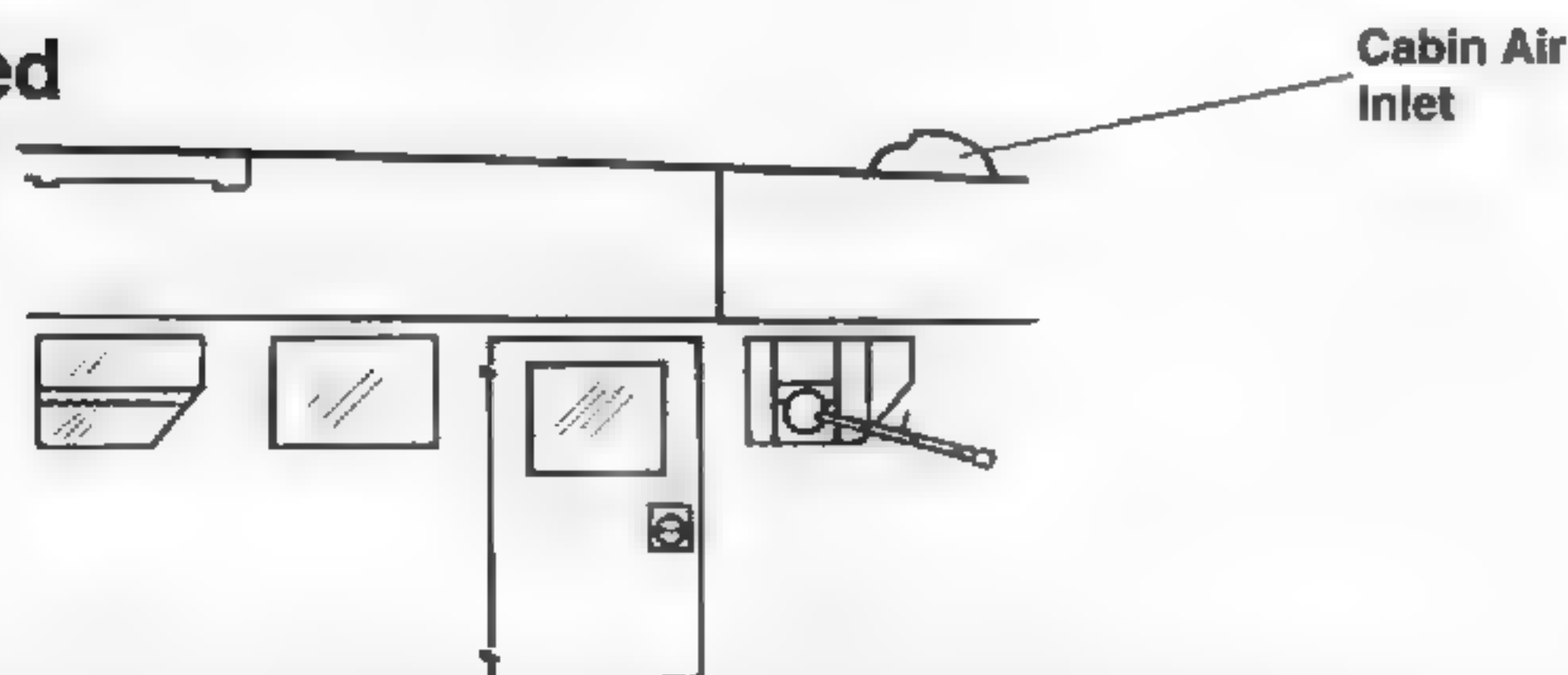
Ground crews feed heated air into the port engine of this Ju 52/3m on the Eastern Front, while the other two engines are warming up. Preheating the BMW 132 engines was necessary when temperatures fell to -45° Celsius (-49° Fahrenheit) in Russia. This Ju 52/3m has the standard two oil coolers mounted under and aft of each engine. (Bundesarchiv)

## Cabin Inlet Development

### Standard Ju 52/3m

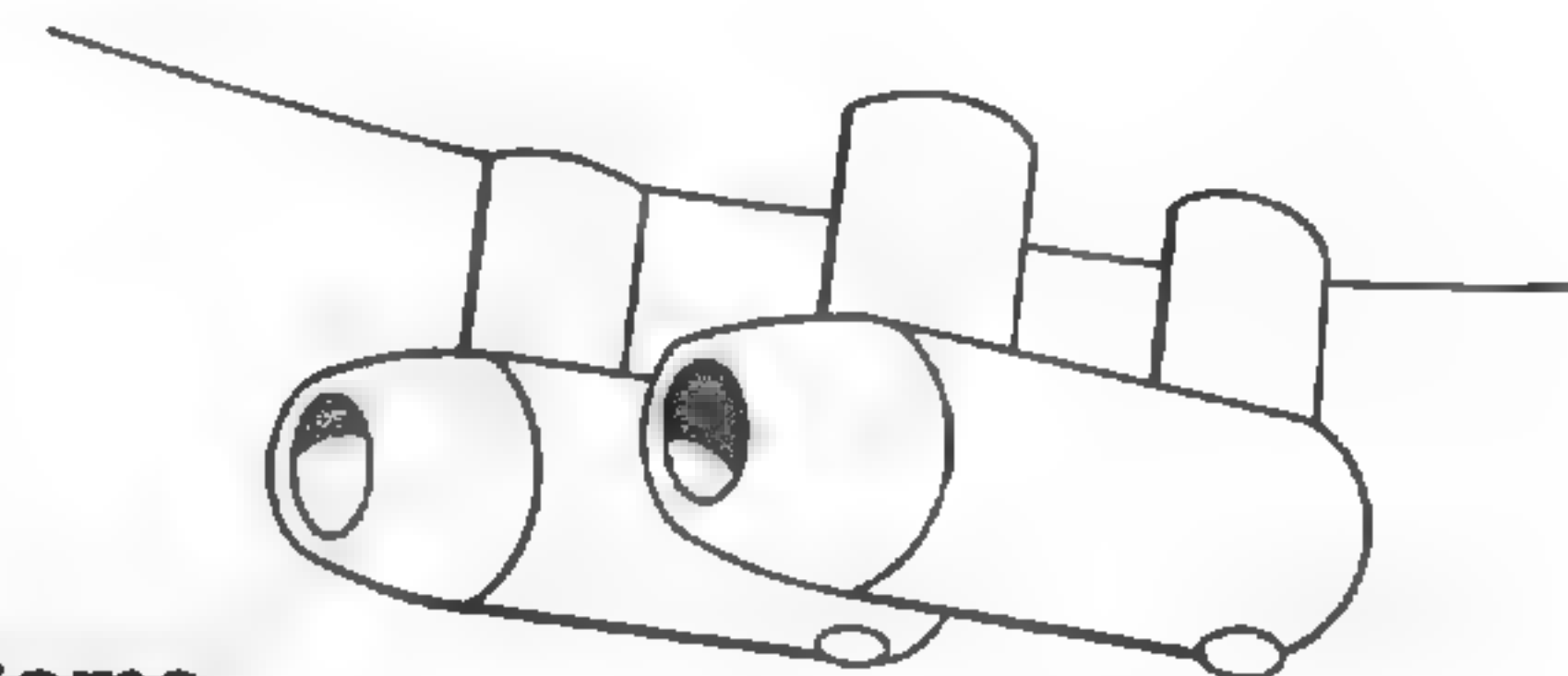


### Tropicalized Ju 52/3m

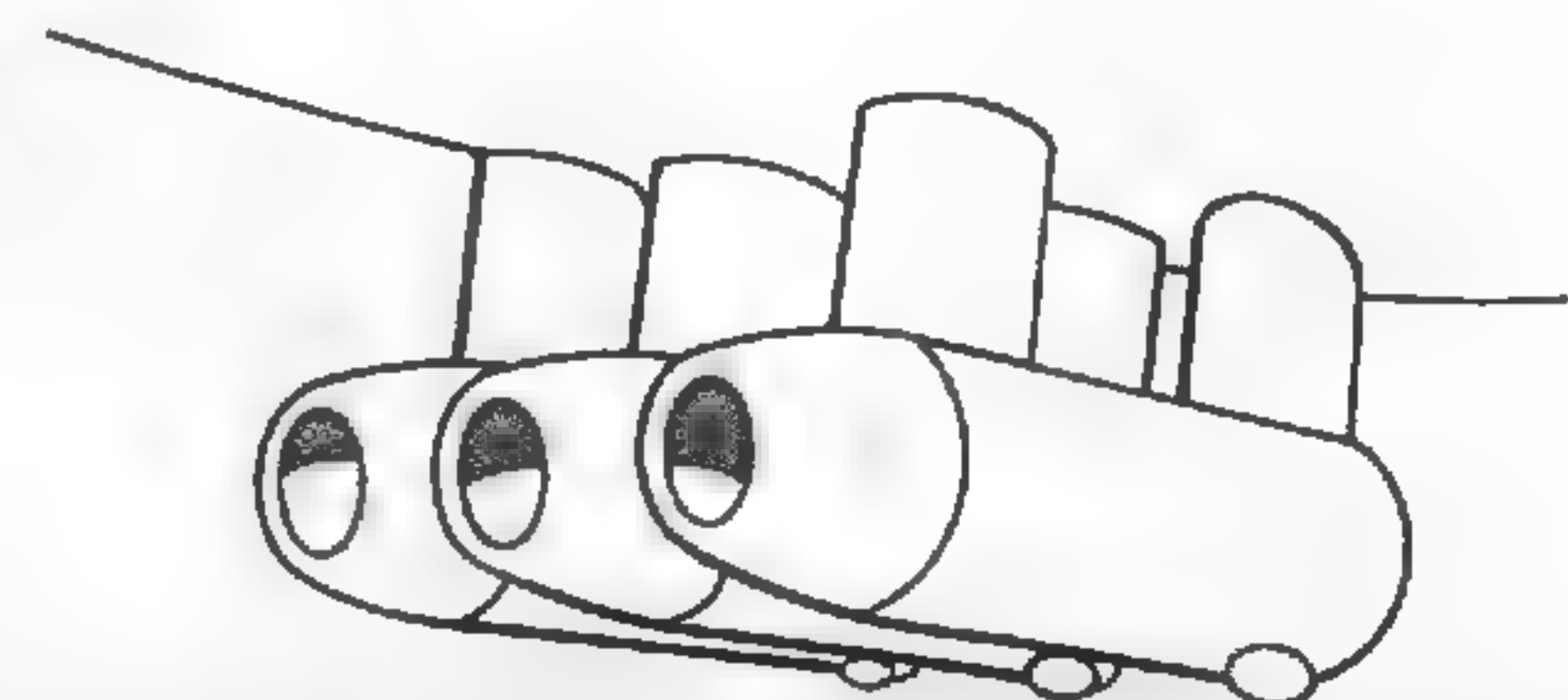


## Oil Cooler Development

### Standard Ju 52/3m Two Coolers Per Engine



### Variation on Some Ju 52/3ms Three Coolers Per Engine







This Ju 52/3m g3e suffered a main landing gear failure when making a hard landing. This was one of several Ju 52/3ms equipped with three oil coolers under and aft of each engine, instead of the standard two coolers per engine. The usual engine front covers were not used on this Ju 52/3m g3e, while an anti-oil spill plate is fitted above the center engine. (Manfred Griehl)

A gunner wearing a life jacket stands behind one of the beam mounted 7.92mm MG 15 machine guns on a Ju 52/3m. One weapon each was mounted in the port and starboard mid-fuselage stations, which were immediately aft of the cabin. The 108 cm (42.5 inch) long MG 15 had a firing rate of 1100 rounds per minute.



This Ju 52/3m g5e was assigned to a *Transportstaffel* of the VII. *Fliegerkorps* (7th Air Corps) at Cunlow, Poland in the early summer of 1944. A hand hold rail normally associated with Ju 52/3m (See) floatplanes is mounted under the side windows. The wing flaps depressed 25° for takeoff and at its maximum 40° for landing. (Punka Archiv)

A KG 27 Ju 52/3m g3e (1G+EK) is parked on a snow-covered airfield in Russia. A Plexiglas hood from a Heinkel He 111 bomber is mounted above the dorsal gunner's position. This protected the gunner from the bitter cold air and was used on several Ju 52/3ms operating on the Eastern Front. (Ernö Nagy)





# Ju 52/3m in the Spanish Civil War

Since Spain became a republic in 1931, tensions among the social classes were increasing. These tensions exploded into civil war on 18 July 1936, when Gen Francisco Franco rebelled against the Republic at Melilla, Spanish Morocco. Germany offered to support Franco's Nationalist forces and deployed 20 Ju 52/3m g3es to Tetuan, Spanish Morocco on 27 July. The aircraft flew 500 Nationalist troops to Tablada, near Sevilla in Nationalist-held Spain in the first week. The German pilots flew up to four flights a day, ferrying men and materiel across the Strait of Gibraltar and over the Republican naval blockade. This first strategic airlift in history ended in mid-October of 1936, after nearly 14,000 troops and 500 MT (551.1 tons) of equipment were flown from Spanish Morocco to mainland Spain.

Ju 52/3m g3es were soon flown in their auxiliary bomber role, beginning with a single aircraft raid on Republic troop concentrations on 3 August 1936. Ten days later, two Ju 52/3ms attacked the Republican battleship JAIME I near Malaga, disabling the warship with a pair of 250 KG (551.1 pound) bombs. Ju 52/3ms flew air supply missions to the besieged Nationalist garrison holding the Alcazar castle in Toledo on 20-21 August. The supplies airdropped by the Junkers transports enabled the Nationalists to hold out until the siege was lifted several days later. The Germans converted six Ju 52/3m g3es to bombers by late August and flew the first bombing mission against the Republican capital of Madrid on 27 August.

The Ju 52/3ms in Nationalist-held Spain were formed with other air and ground units into the *Legion Condor* on 7 November 1936. The German 'volunteers' were reinforced by the

This Ju 52/3m g3a (22-73) was one of the first Junkers aircraft assigned to *Kampfgruppe* (Bomber Group) 88, *Legion Condor* in Sevilla, Spain. The Germans flew the first 31 Ju 52/3ms from Greifswald, Germany to Nationalist-held Spain, via Lechfeld, Germany. This aircraft is overall RLM 63 Green Gray (FS36373), with black and white trim and markings. (Wilfried Moll)

deployment of 31 additional Ju 52/3ms. The Junkers aircraft formed three *Staffeln* (Squadrons) of the Legion's K/88 (*Kampfgruppe*; Bomber Group). The Nationalists assigned the code number 22 to Ju 52/3ms, and this code number preceded the individual number on the fuselage sides. The Ju 52/3ms were flown on daylight bombing missions until the Republicans began flying Soviet-supplied Polikarpov I-15 biplane and I-16 monoplane fighters later in 1936. These fast and well-armed aircraft found the slow flying Ju 52/3ms easy prey and losses mounted for the *Legion Condor*. This resulted in the Junkers aircraft being relegated to bombing missions at night or in less well-defended sectors of the front.

K/88 Ju 52/3ms participated in the bombing of Guernica, approximately 20 KM (12.4 miles) east of Bilbao, on 26 April 1937. The force was briefed to bomb a railroad station and a bridge east of the town, but bad weather resulted in a navigation error. This error resulted in the aircraft's bombs hitting the center of Guernica, killing 300 people and destroying approximately 70 percent of the town.

Germany supplied 59 Ju 52/3m g3e and g4e aircraft – including two floatplanes – to the Nationalist forces by 16 July 1937. The next month saw most of these aircraft being transferred from the *Legion Condor* to a pair of Spanish *Grupos de bombardeo nocturno* (Night Bomber Groups): 1-G-22 and 2-G-22. The latter unit flew the last Ju 52 bombing mission of the Civil War against the town of Belmez on 26 March 1939. The Legion's remaining Ju 52/3ms were flown on transport missions for the remainder of the conflict.

Franco's Junta forced the Republic's surrender on 31 March 1939, ending the Spanish Civil War. Nationalist Ju 52/3ms flew 5400 sorties and dropped 5803.4 MT (6397 tons) of bombs. Approximately 25 of the 59 aircraft supplied to Spain were lost in action.

The *Legion Condor* assigned this Ju 52/3m g3e (D-CSAN) for medical evacuation duties during the Spanish Civil War. Canvas covers have been placed over the engines to keep dust out of the powerplants. Red crosses were painted on the wings, fuselage, and vertical tail surfaces. These crosses were on white circles edged in black. Early Ju 52/3ms – including those deployed to Spain – had black main wheel spats. (Harold Thiele)

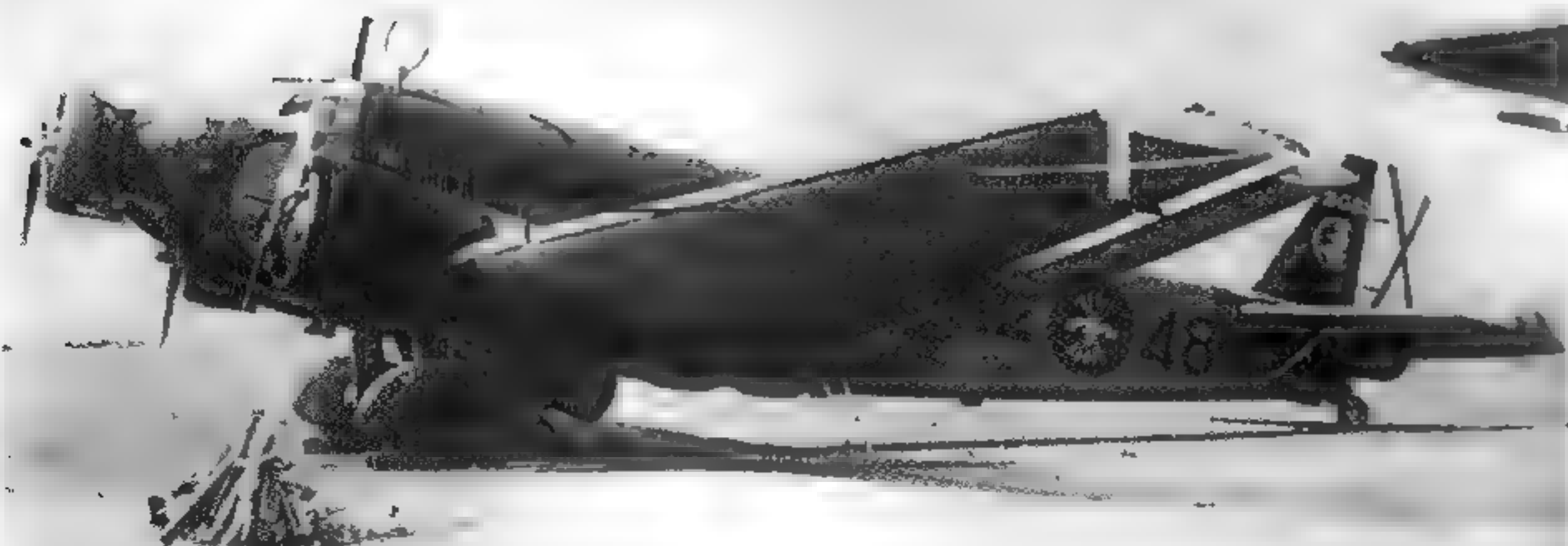






A *Kampfgruppe* 88 Ju 52/3m g3e (22-90) is serviced at its base in Nationalist-held Spain. From late 1936, the Ju 52/3ms were camouflaged in RLM 61 Dark Brown (FS30040), RLM 62 Green (FS34128), and RLM 63 Green Gray, with RLM 65 Light Blue (FS35352) under-surfaces. The X on the fuselage side is blue (approximately FS35260). Nationalist Ju 52/3m fuselage codes began with 22. (Harold Thiele)

This Ju 52/3m g3e (22-48) was assigned to the Spanish 2nd Night Bombing Group, whose 2-G-22 code is painted on the tail. The unit's three winged elephants insignia appears below the unit code. The red Phalange insignia is painted on the black fuselage disc, while the aircraft name NAVARRA aft of the cockpit area is white. (Harold Thiele)



A *Legion Condor* Ju 52/3m g3e bomber is overhauled between missions. This particular Junkers has three oil coolers under each engine, rather than the usual two coolers. The skull and Zaragoza painted on the nose refers to raid K/88's Ju 52s flew on that Spanish city. The black wheel spats were trimmed in white. (Harold Thiele)

Although Spain primarily received Ju 52/3m g3e and g4e aircraft, several Ju 52/3m reo airliners were also delivered. This Ju 52/3m reo (91-3) was assigned to the Spanish Air Force for staff transport after the Civil War. Wing and fuselage roundels are red and yellow. This variant was optimized for high altitude flights and had a cabin inlet mounted on the upper aft fuselage. (Harold Thiele)





# Ju 52 in the Sino-Japanese War

*Deutsche Lufthansa* (DLH) and the Chinese Government formed the Eurasia Aviation Corporation as a joint venture in February of 1930. Eurasia ordered nine Ju 52/3m ges, which were delivered between September of 1934 and September of 1938. The first three aircraft began operations in 1935, with German flight and ground crews. Eurasia's network included service to Nanking (now Nanjing), Shanghai, Canton, Hong Kong, Lanchow, and Hanoi in Tonkin, French Indochina (now Vietnam). No national registration marks were painted on Eurasia's Ju 52/3ms; the aircraft were simply named Eurasia XV (15) and Eurasia XVII (17) through XXIV (24). Several of these airliners were equipped with three oil coolers under each BMW 132 radial engine, while others had the standard two coolers per engine.

Chinese President Chiang Kai-Shek and his wife Maylong Soong were captured by Marshal Chang Hsueh-Liang, a warlord in Xian, on 11 December 1936. Chang and his wife were released four days later and flown on a Eurasia Ju 52/3m from Xian to Nanking – China's temporary capital – on 15 December.

Japan invaded China without a declaration of war on 7 July 1937, beginning the Sino-Japanese War. German pilots continued to fly Eurasia's Ju 52/3ms despite the conflict. Eurasia XVIII (18) was the first of the Ju 52/3ms lost during the war, when it was destroyed by Japanese aircraft at Kunming on 1 August 1937. Four more Junkers transports were lost to accidents or Japanese raids between July of 1938 and December of 1939.

Germany, Italy, and Japan signed the Tripartite Pact on 27 September 1940. This resulted in the Chinese Government ordering Eurasia to cease operations by November of that year. The firm operated solely on behalf of the Chinese Government until 1 August 1941, and the last German employees were forced to leave China on 15 September 1941.

The remaining Ju 52/3m ges continued to fly for the Chinese Air Force and were camouflaged with a green dapple on the upper surfaces. National markings were painted on the upper and lower wing surfaces. A Japanese raid on Hong Kong destroyed three of these ex-Eurasia aircraft on 8 December 1941. Chiang frequently used surviving Ju 52/3ms on wartime flights to sections of his vast country, including meetings with Communist leader Mao Tse-Tung.

This ex-Eurasia Ju 52/3m was transferred to the Chinese Air Force in 1941. Dark green mottling was painted over the natural metal finish. Blue and white Chinese roundels were painted on the wings and blue and white stripes appeared on the rudder. The Douglas DC-2 in the background was assigned to China National Aviation Corporation (CNAC). (San Diego Aerospace Museum via Ray Wagner)



This Ju 52/3m ge Eurasia XVII (17) was delivered to Eurasia on 24 October 1935. It was the second of nine Ju 52/3ms delivered to the Chinese-German airline between 1934 and 1938. The aircraft was natural metal with black trim and markings. Eurasia XVII was destroyed during a Japanese attack on Hanchung, China on 6 May 1939. (Lufthansa)

The German flight crew of a Eurasia Ju 52/3m ge poses before their aircraft at Sianfu in 1936. They are flanked by several troops loyal to insurgent Marshall Chang Hsueh-Liang, who kidnapped Chinese leader Chiang Kai-Shek and his wife, Maylong Soong on 11 December 1936. The Chiangs were released on 15 December and flown to Nanking on this aircraft. (San Diego Aerospace Museum via Ray Wagner)





# Ju 52/3m in Luftwaffe Service

The Luftwaffe had 547 Ju 52/3m g3e and g4e aircraft in service at World War Two's beginning on 1 September 1939. They were primarily tasked with flying supplies to the front and returning wounded soldiers to rear area hospitals. Several Ju 52/3ms flew a bombing mission on the Polish capital of Warsaw on 25 September. Soldiers pushed incendiary bombs through the portside crew entrance door.

The Luftwaffe deployed 573 Ju 52/3ms for Operation WESERÜBUNG (Weser Exercise), the German invasion of Denmark and Norway on 9 April 1940. These aircraft flew personnel and supply transport missions during this operation, which included the difficult, yet successful dropping of paratroopers on the Norwegian airfields of Oslo-Fornebu and Stavanger-Sola and the bridge at Vordingborg. Thirteen Ju 52/3ms assigned to KGzbV 102 flew artillery to German forces at Narvik by landing on the frozen ice on Hartvigann Lake. The aircraft lacked fuel to fly back and were abandoned by their crews. The Ju 52/3ms sank to the lake's bottom when the ice melted that spring. The Junkers transports flew 29,000 troops, 2414 MT (2660.9 tons) of weapons and ammunition, and 118,000 L (31,172.4 gallons) of aviation fuel during the campaign.

The Luftwaffe employed 430 Ju 52/3ms on the German invasion of Western Europe – code-named FALL GELB (Plan Yellow) – that began on 10 May 1940. Several transports towed DFS 230 gliders carrying German paratroopers to successfully attack Belgium's Fort Eben Emael. Others dropped paratroopers on the Netherlands, although Dutch anti-aircraft defenses took a toll on the Ju 52/3ms. Although FALL GELB was a success, over half of the Ju 52/3ms in this campaign were lost. The Luftwaffe made good on these losses through production of new aircraft and by commandeering more *Deutsche Lufthansa* Ju 52/3ms and their crews.

Beginning in February of 1941, Ju 52/3ms began airlifting troops and supplies to the German *Afrika Korps* in Libya. One *Gruppe* (Group) of KGzbV 1 flew these missions from Comiso, Sicily, across the Mediterranean Sea. Most of the Ju 52/3ms flew up to three missions per day, with flight crews spending up to 12 hours in the air. The transports flew up to 1000 troops and 25 MT (27.6 tons) of supplies to North Africa each day. The slow Ju 52/3ms were vulnerable to Allied fighters and losses mounted as the campaign continued.

The Wehrmacht launched Operation *MERKUR* (MERCURY), the invasion of Crete, on 20 May 1941. The Luftwaffe sent 493 Ju 52/3ms to fly 8500 paratroopers and tow gliders to the Greek island, which was defended by Greek and British Commonwealth troops. German forces captured Crete 11 days later, but at the high cost of 4000 paratroopers killed and 151 Ju 52/3ms destroyed or damaged beyond repair. This was the last major German airborne operation of the war.

The heavy losses at Crete and commitments elsewhere meant that only 150 Ju 52/3ms were assigned to the Eastern Front when Operation BARBAROSSA – Germany's invasion of the Soviet Union – began on 22 June 1941. These transports were hard pressed flying supplies to the rapidly advancing Wehrmacht units and other Ju 52/3ms were redeployed to the east. Ju 52/3ms were key to supplying the trapped German II (2nd) Corps at Demyansk, Russia in early 1942. The Ju 52s flew daily to deliver up to 300 MT (330.7 tons) of supplies to the German troops. This occurred despite temperatures falling down to -45° Celsius (-49° Fahrenheit), which caused great difficulties for the aircraft and their crews. Nevertheless, the Germans flew 64,884 MT (71,521.2 tons) of supplies and over 30,000 troops to the Demyansk pocket between 21 February and 18 May 1942. The Junkers flew over 35,000 wounded out to German rear areas. Soviet fighters, anti-aircraft fire, and accidents took their toll, resulting in the loss of 265 German aircraft – the majority of these being Ju 52/3ms.

The success of the Demyansk airlift prompted the Luftwaffe to attempt a larger scale operation at Stalingrad (now Volgograd, Russia), after the German Sixth Army was encircled on 19



This Lufthansa Ju 52/3m fe (RUDOLF BERTHOLD, D-2624, *Werk Nr.* 4026) was assigned to the *Flug-Eisenbahn-Verkehr* (Air-Railway-Traffic Company) in 1933-34. The *Deutsche Reichsbahn* (German Railway) insignia is painted on the fuselage. German bomber pilots were clandestinely trained in this aircraft prior to the Luftwaffe's unveiling in March of 1935. (Lufthansa)

A Luftwaffe Ju 52/3m g3e (WL-ABUX) is parked at Budaörs airfield, near Budapest, Hungary in 1939. The aircraft is believed to be overall RLM 63 Green Gray with black trim and markings. The WL (*Wehrmacht Luftwaffe/Armed Forces Air Force*) prefix replaced D on second-line Luftwaffe aircraft from January of 1939. The venturi tube mounted just below the cockpit was unusual for this variant. (Laszlo Javor via Martin Kyburz)







This Ju 52/3m g3e's former unit code was overpainted in a light gray and replaced with the nonstandard code 54+ROK. The aircraft is believed to have been flown on staff transport duties early in World War Two. This aircraft retained the black main wheel spats, which were deleted on later Ju 52/3m variants. (Kovacs)

On World War Two's outbreak in 1939, the Luftwaffe impressed several Lufthansa Ju 52/3ms, including this Ju 52/3m reo (KB+LC). It is taxiing at Budaörs airfield near Budapest early in the conflict. The Luftwaffe operated few Ju 52/3m reos, which primarily flew in South America before the war. This variant was optimized for high altitude performance. (Punka Archiv)



November 1942. The Germans deployed 375 Ju 52/3ms to Morzovskaya and Tatinskaya, approximately 241 KM (149.8 miles) west of Stalingrad, from where the airlift began on 25 November. The Sixth Army required 750 MT (826.7 tons) of supplies daily, but this proved beyond the Luftwaffe's means. The bitterly cold Russian winter heavily taxed the Ju 52/3ms and their crews, many of whom lacked proper winter clothing. The transports delivered an average of 84.4 MT (93 tons) a day by mid-December – well below the Sixth Army's requirements. Weather and the steadily improving Soviet fighter and anti-aircraft defenses made the flights into and out of Pitomnik airfield in the Stalingrad pocket an increasingly dangerous undertaking. Soviet forces pushed the Germans further west of Stalingrad and tightened the ring around the city, which further hampered German air supply efforts. The Luftwaffe lost 266 Ju 52/3ms and over 1000 airmen by the time of the Sixth Army's surrender on 2 February 1943. The Soviets captured nearly 100 Ju 52/3ms in slightly damaged condition, which were repaired and pressed into service. These additional aircraft enhanced the limited Soviet air transport fleet.

German Ju 52/3ms participated in the evacuation of the 17th Army from the Kuban area of the Soviet Union's north Caucasus region in the spring of 1943. From 19 April 1943, Ju 52/3ms aided in suppressing the Jewish revolt in the Warsaw Ghetto. The Junkers aircraft dropped leaflets and bombs onto the Jewish rebels.

The final large-scale Ju 52/3m operation of World War Two was the attempt to resupply besieged German forces in Breslau (now Wrocław, Poland). The aircraft began their missions to Breslau in mid-February of 1945 and the last three Ju 52/3ms landed in the city on 7 April. The Junkers aircraft comprised most of the 165 Luftwaffe aircraft destroyed in the relief effort.

Sporadic Ju 52/3m flights were made to Berlin while it was surrounded by the Soviet Red Army. The final supply mission into the German capital was flown by Ju 52/3ms of *Transportgeschwader 3* (TG 3) on 29 April 1945, the day before *Führer* (Leader) Adolf Hitler committed suicide in his bunker. The aircraft dropped supplies over the Tiergarten, near the *Reichskanzlei* (Reich Chancellery).

*Transportgeschwadern 1, 2, and 3* and *Transportgruppe 20* had 190 Ju 52/3ms on strength on 25 April 1945. Various Allied countries took over 137 of these aircraft after V-E (Victory in Europe) Day on 8 May 1945. Few Ju 52/3ms from the over 3400 aircraft built during the war survived this conflict.

Three Junkers Ju 87R Stuka dive-bombers escort a Ju 52/3m g4e headed for Crete in May of 1941. The transport was assigned to 9. *Staffel* (Squadron) of KGzbV 9 (*Kampfgeschwader zur besonderen Verwendung*; Bomber Group for Special Duties). The Ju 52/3m's cabin windows were plated over for this flight for an unknown reason. (Bundesarchiv)







A Luftwaffe pilot stands beside a Ju 52/3m in Greece during the spring of 1941. The center engine cowling and front of the wing cowling are painted RLM 04 Yellow (FS33538) for the Balkan campaign. The narrow oil filler cap and the wider fuel filler cap are mounted atop the wing nacelle. These items were standard on all Ju 52/3ms. The Ju 52/3m's basic main undercarriage design remained little changed throughout its career. (Bundesarchiv)

Finnish troops gather near a KGzbV 1 Ju 52/3m g5e deployed to Finland. The Wing insignia is painted on the nose, while a partial Yellow band is located under the fuselage national insignia. This aircraft lacked the wind-driven electrical generator usually fitted to the upper starboard fuselage. (Klaus Niska)



A Ju 52/3m g4e (SE+XX) is parked at Szombathely, Hungary during the Balkan campaign (Operation MARITA) in April of 1941. The entire vertical tail was painted RLM 04 Yellow, except for the black and white *Hakenkreuz* (swastika). Normally, only the rudder and aft fuselage band were Yellow on German aircraft operating on the Eastern Front. (Punka Archiv)

Soviet civilians aid German troops loading a Ju 52/3m g4e on the Eastern Front in late 1941. The Yellow fuselage band was painted immediately aft of the cargo door. German marking regulations were not always adhered to in the field. (Bohumir Kudlicka)







A Ju 52/3m g6e (BJ+YD) ambulance is prepared for its next mission from German-occupied Norway. Temporary white paint was put over the RLM 70 Black Green (FS34050) and RLM 71 Dark Green (FS34079) upper surfaces. Red crosses on white circles replaced the German national insignia on the fuselage and wings. Ju 52/3m ambulances had an aft fuselage cabin ventilation inlet. (Bundesarchiv)

German troops guide a horse-drawn sledge carrying supplies in the Stalingrad pocket during the winter of 1942-43. A nearby truck drives past the Ju 52/3m that just landed with materiel for the encircled German Sixth Army. Ju 52/3ms and other transports suffered great losses in their futile attempt to supply the German forces in Stalingrad. (Bundesarchiv)

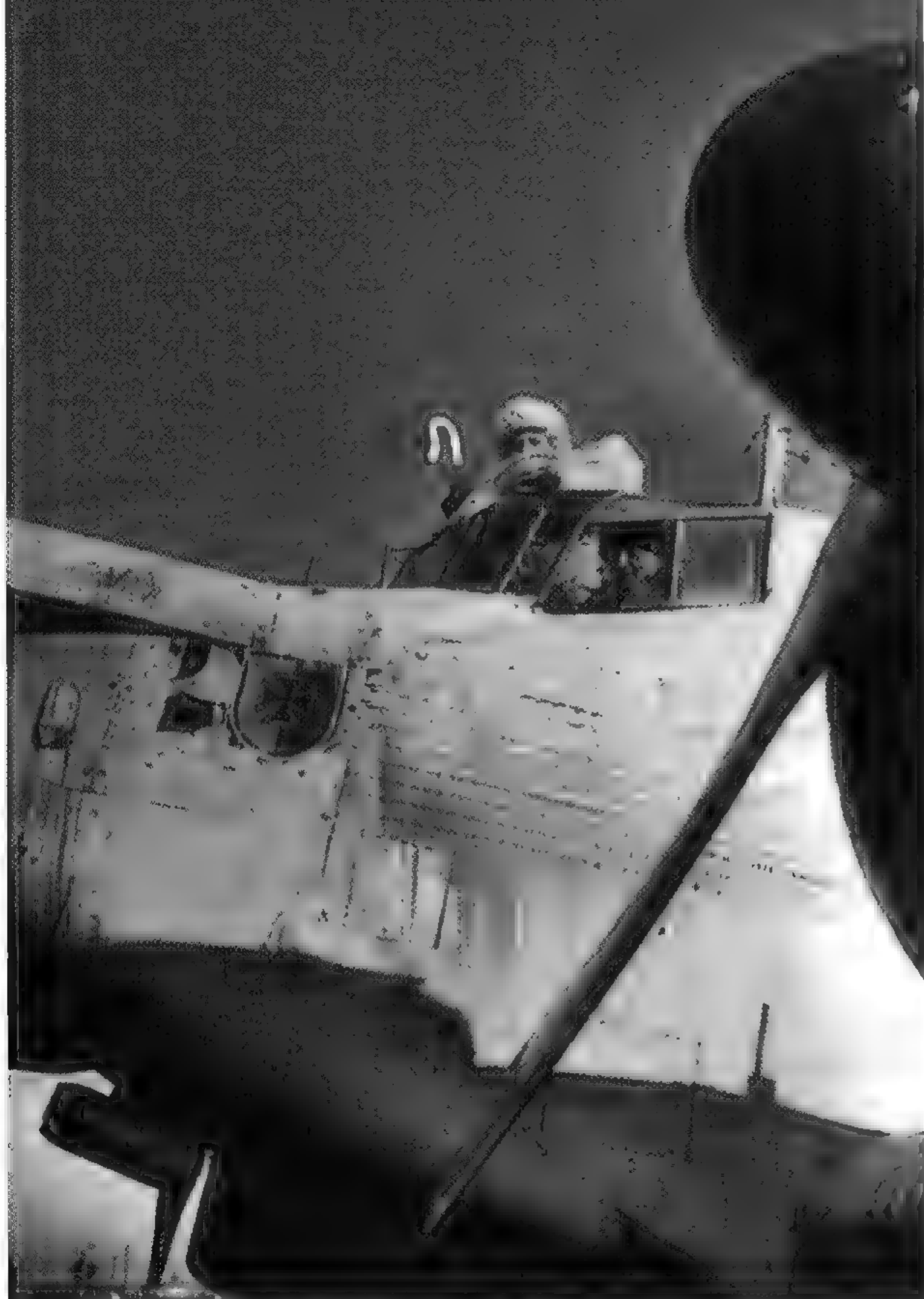


An overall RLM 70 Black Green Ju 52/3m g7e (1Z+HU) is parked on a German airstrip in North Africa. This variant introduced a straight pitot tube on the port wing to collect air-speed data. Earlier Ju 52/3m pitot tubes curved down at the leading end. The ventilation inlet fitted atop the fuselage was installed on most Ju 52/3ms sent to North Africa. (Carlo Lucchini)

Three Slovak soldiers pose before a TG 3 (*Transportgeschwader*, Transport Wing) Ju 52/3m g4e. This aircraft ferried Slovak troops from Slav'ansk, Ukraine to Kerch in the Crimean Peninsula on 8 February 1943. TG 3's insignia is painted on the aircraft's nose. (Ivo Zetik)







The co-pilot stands through the cockpit window of a Ju 52/3m during the Stalingrad airlift in 1942-43. The pilot sits in the cockpit of his aircraft, whose upper surfaces are temporarily painted white. The port engine's propeller hub is fitted with a large spinner, seldom found on these aircraft. Harsh winter conditions greatly impaired Ju 52/3m flight operations and combined with Soviet defenses in downing many Luftwaffe transports. (Bundesarchiv)



A corpsman attends to wounded soldiers being airlifted from the Eastern Front aboard a Ju 52/3m g4e. Stretches were arranged in two rows inside the cabin, which held up to 12 stretcher patients. The ordered arrangement was seldom found under more hurried circumstances, including the Stalingrad airlift. Radio equipment flanks the cockpit passageway, while the radio operator's seat is located aft of the starboard bulkhead. (Bundesarchiv)





A Ju 52/3m g9e painted with the temporary code Z3K sheared off its main landing gear upon landing at a North African airfield. The g9e was a tropicalized variant of the earlier Ju 52/3m g4e. The newer version featured a cabin ventilation inlet mounted atop the mid-fuselage. This inlet was similar to the one installed on civil Ju 52/3m ges; however, the latter aircraft's inlet was located further aft on the fuselage. (Kovacs)

Field Marshall Albert Kesselring used this Ju 52/3m g3e (BT+AY) as his personal transport throughout World War Two. He named it *Scheich* (Sheik), which is painted on the nose. This Ju 52/3m g3e had a cabin ventilation inlet added to the upper aft fuselage, while the forward cabin door was fitted to the third window from the front. (Ernö Nagy)



German paratroopers descend from Ju 52/3ms during an exercise. They exited the aircraft from the port aft fuselage door and their parachutes were opened immediately by a static line. The Germans only mounted small-scale airborne operations after the great losses sustained at Crete in May of 1941.

This Ju 52/3m g7e (V1+LB) sustained a port main landing gear collapse while landing on a snow-covered Eastern Front airfield. The aircraft was assigned to a transport squadron of the VII. Fliegerkorps (7th Air Corps). Part of the upper surfaces were painted white, while the rest of the upper surfaces remained RLM 71 Dark Green. An unknown unit insignia is painted on the port engine cowling. (Ernö Nagy)







German *Stabsheiferin* (Woman Auxiliary) personnel crowd beside a Ju 52/3m g3e in Yugoslavia. A pentangular window has replaced the usual small round window aft of the port cabin door. This window is slanted forward, rather than the standard aft slant for this item. A socket for an MG 15 machine gun is mounted in the lower central portion of this window. Aluminum alloy sheets replaced three of the cabin windows. (Bohumir Kudlicka)

British forces captured this hybrid Ju 52/3m at the end of World War Two. The fuselage is taken from a Ju 52/3m g3e, while the wings and undercarriage are from a Ju 52/3m g14e. Oil coolers under the center engine are typical for late production aircraft. An antenna wire leads from the antenna mast to the vertical stabilizer. This Ju 52/3m was assigned the Air Ministry code AIR MIN 104 and based at the Royal Aircraft Establishment at Farnborough, England in August of 1945. (Imperial War Museum)



## Lufthansa Ju 52/3ms at War

In January of 1939, *Deutsche Lufthansa* (DLH) had 73 Ju 52/3ms in service, including 15 in South America. The airline acquired 26 more Ju 52/3ms during 1939, including six from Austria's ÖLAG. DLH lost four Ju 52/3ms to accidents and sold 17 others to Spain's *Iberia* and Brazil's *Syndicato Condor*. The airline flew 74 Junkers trimotors in Europe and four others in Ecuador and Peru at the end of 1939. The Luftwaffe requisitioned several DLH Ju 52/3ms at the war's start to supplement their transport units. The DLH flight crews were drafted with their aircraft for the duration of the war.

The airline purchased six additional aircraft in 1940, while selling one each to Eurasia, *Sedta*, and *Syndicato Condor*. DLH had 78 Ju 52/3ms in Europe and two in Peru by year's end. The airline lost 20 Ju 52/3ms to accidents or enemy action during 1941, including 18 in Luftwaffe service. In 1942, one Ju 52/3m on a DLH flight was destroyed in an accident, while 18 others in Luftwaffe service were written off. Peru's government seized the two Ju 52/3ms on their territory in early 1942, leaving DLH with 47 Ju 52/3ms by year's end.

DLH's Ju 52/3ms flew extensively throughout German-occupied and pro-German Europe during 1943. In December of 1943, 37 of DLH's 41 Ju 52/3ms were operating on Luftwaffe duties. This year also saw the airline discontinue cabin services with stewardesses, due to wartime personnel demands. Nine Ju 52/3ms were lost on Luftwaffe service during 1944. There were 34 Ju 52/3ms in DLH's inventory at year's end, with 28 of these assigned to Luftwaffe duties.

Two DLH Ju 52/3ms were lost on evacuation flights from Berlin during the last days of the war. The last flyable Ju 52/3m left Berlin-Tempelhof airfield on 22 April 1945. Nearly 200 DLH personnel were killed while flying civil operations during World War Two.

A German delegation exits a Lufthansa Ju 52/3m reo, OLAF BIELENSTEIN (D-AIAG) at Budaörs airfield near Budapest. The aircraft is overall RLM 63 Green Gray, with black trim and lettering. This scheme was standard on Lufthansa's fleet during World War Two. The Nazi flag on the tail was red, white, and black. (Laszlo Javor via Martin Kyburz)





## Foreign Ju 52/3ms

Germany sold three Ju 52/3m g3es to the *Österreichische Luftstreitkräfte* (ÖLSK; Austrian Air Force), who received them in July of 1937. Two of these aircraft (*Werk Nr.* 5807, 36 and *Werk Nr.* 5820, 37) were delivered as auxiliary bombers/transport. The third Ju 52/3m g3e (*Werk Nr.* 5835, 3) was a staff transport and assigned the civil registration OE-HKA. All three ÖLSK aircraft were reassigned to the Luftwaffe after Germany's *Anschluss* (Annexation) of Austria on 13 March 1938.

In October of 1939, the Swiss Air Force received three Ju 52/3m g4es for navigator and observer training. The three aircraft (*Werk Nr.* 6580, 6595, and 6610) were assigned Swiss Air Force serial numbers and Swiss civil registrations (A-701/HB-HOS, A-702/HB-HOT, and A-703/HB-HOP, respectively). They were flown on transport duties in addition to their original training role. During their post-war service, the Swiss replaced the main landing gears with those from French-built Ju 52/3ms and the tail wheels with nose wheels from de Havilland DH-100 Vampire jet fighters. The Swiss Air Force retired their Ju 52/3m g4es in September of 1982 and they were sold to the Ju-Air Company at Dübendorf, where they occasionally fly sightseeing trips.

The *Magyar Királyi Honvéd Légierő* (MKHL; Royal Hungarian Air Force) commandeered six Ju 52/3m ges delivered to Hungary's state airline *Malért* in 1937 early in World War Two. They were assigned to the 2nd Transport Squadron and flew supply missions between Hungary and the Second Hungarian Army on the Don River during the summer of 1942. Germany delivered a Ju 52/3m g7e (*Werk Nr.* 3208) to Hungary that September for ambulance duties. MKHL

This Ju 52/3m g3e (37, *Werk Nr.* 5820) was one of three aircraft delivered to Austria in July of 1937. The 'dustbin' ventral gun turret is retracted while the aircraft is on the ground. This and another Ju 52/3m were flown as auxiliary bomber/transport, while the third was a staff transport. After Germany annexed Austria in March of 1938, the Luftwaffe flew this aircraft from Vienna-Aspern airfield. (Rupert Relsinger)

Ju 52/3ms participated in the evacuation of Hungarian troops from Poltava, Ukraine in February of 1943. The Junkers trimotors were reassigned to the 102/1 Transport Squadron that September. Five of the six ex-*Malért* aircraft were destroyed on the ground at Börgönd by 325th Fighter Group P-51 Mustangs on 12 and 13 October 1944. The one remaining MKHL Ju 52/3m flew air supply missions into Budapest after the Hungarian capital was encircled by Red Army troops on 24 December 1944. These missions continued until the city's fall on 13 February 1945.

In 1939, two Ju 52/3m g4es were delivered to the *Bulgarski Vozdushni Voiski* (BVV; Bulgarian Air Force). The BVV assigned these aircraft the civil registrations LZ-UNA and LZ-UNB, while their crews nicknamed the Ju 52/3m the *Sova* (Owl). Bulgaria added to these aircraft by purchasing two Ju 52/3m g10es in 1943. The country switched from the Axis to the Allied side in September of 1944 and German troops encircled Bulgarian forces in Ratunda-Drenak the next month. BVV Ju 52/3ms flew 13 sorties to airdrop 14,000 kg (30,864.2 pounds) of supplies despite heavy German anti-aircraft fire. Several intact Luftwaffe Ju 52/3ms were captured at Zeltweg, Austria and taken to Bulgaria. The BVV operated this aircraft for transport and parachute dropping duties until the mid-1950s.

The *Aeronautica Regală Română* (ARR; Royal Romanian Air Force) received its first Ju 52/3ms for its 105th Heavy Transport Squadron in November of 1941. They flew on resupply missions to Romanian troops fighting near Stalingrad in the winter of 1942-43, losing several to accidents and Soviet action. Ju 52/3ms also participated in the evacuation of Romanian forces from the Crimean Peninsula in early 1944. Germany delivered 33 Ju 52/3ms to the ARR, which captured 11 more aircraft after Romania switched to the Allies in August of 1944. Romania's Ju 52/3ms remained in service until the early 1960s.

Ju 52/3m lu aircraft built for Italy's airline *Ala Littoria* were impressed into the *Regia*

Italy's *Regia Aeronautica* (Royal Air Force) commandeered this Ju 52/3m lu (I-BIZI, *Werk Nr.* 4064) from *Ala Littoria* in mid-1940. The civil registration remained on the fuselage side, while Italian markings were painted on the wings and rudder. The Ju 52/3m lu was a Ju 52/3m ge powered by either Piaggio Stella X or Alfa Romeo 126 RC/34 radial engines. (Carlo Lucchini)





*Aeronautica* (Royal Italian Air Force) in 1940, but retained their civil markings. Two of these aircraft (*Werk Nr.* 4064 and 6765) were seized by Germany after the Italian Armistice in 1943. They were assigned to *Deutsche Lufthansa* as D-AIAO and D-AIAT, respectively.

Two ex-Luftwaffe Ju 52/3m g7es (*Werk Nr.* 501219 and 501196) were stranded in Norway on VE-Day (8 May 1945). In August of 1946, they were taken on by the *Kongelige Norske Luftforsvaret* (KNL; Royal Norwegian Air Force) and given the fuselage codes Y-AB and Y-AC, respectively. The Norwegians nicknamed Y-AB 'Jampa' and Y-AC 'Lajla.' On 15 September 1950, the KNL transferred these Ju 52/3ms to the *Força Aerea Portuguesa* (FAP; Portuguese Air Force). These two aircraft were joined by 13 ex-Armée de l'Air (French Air Force) Ju 52/3ms in December of 1960.

Several Ju 52/3ms were also stranded in Czechoslovakia at the end of World War Two. These aircraft were refurbished and served in the *Ceskoslovenské Letectvo* (CL; Czechoslovak Air Force) under the designation D-52 (*Dopravni*; Transport).

Adolf Hitler donated this ATG-built Ju 52/3m g7e (*Werk Nr.* 3208) to the Royal Hungarian Air Force in September of 1942. The aircraft was used for ambulance duties, with red crosses painted on white circles on the wings and fuselage. The Hungarian colors – red (top), white, and green – were painted on the rudder and horizontal stabilizers. This Ju 52/3m served alongside others commandeered from the Hungarian airline *Malért*. (Punka Archiv)



A Swiss Air Force Ju 52/3m g4e (A-701, *Werk Nr.* 6580) flies a training mission near Rapperswil, Switzerland on 20 June 1941. This aircraft was assigned the German civil registration D-AYWV on its ferry flight to Switzerland in October of 1939. The Swiss received three Ju 52/3m g4es for transport and training missions. Upper surfaces were RLM 70 Black Green (FS34050), while the Swiss national insignia was a white cross on a red background. (Swiss Aviation Museum)

A Royal Romanian Air Force Ju 52/3m g7e (12) taxis before the start of a mission. A *Condor-Haube* (Condor Hood) is mounted atop the canopy for a gunner armed with a 7.92mm MG 15 machine gun. The yellow Eastern Front identification band is painted on the aft fuselage. The side windows are plated over and a handrail is mounted along the starboard fuselage. (Dan Antoniou)





# AAC-1 Toucan

During World War Two, Germany sought to meet Ju 52/3m demand while freeing up German plants for more modern combat aircraft. The former Amiot factory at Colombes, northwest of Paris, was set up to build the Ju 52/3m. This factory completed 321 aircraft for the Luftwaffe between June of 1942 and its liberation by the Allies in the summer of 1944. In late 1944, the Amiot plant was renamed *Ateliers Aeronautiques de Colombes* (AAC) and began building Ju 52/3m g14es for the *Armée de l'Air* (French Air Force) and Air France under the designation **AAC-1 Toucan**. These aircraft were used to ferry home French prisoners of war and forced laborers from German territory. AAC completed 415 Toucans from late 1944 until early 1948 and refurbished 28 ex-Luftwaffe Ju 52/3ms for French service.

The AAC-1 differed from the Ju 52/3m g14e in having longer exhaust stubs on the center engine and a tall antenna mast on the upper fuselage instead of the DF loop antenna on the upper nose. The main wheels were replaced by those from Douglas C-47 Skytrains (military DC-3s), which had a slightly smaller diameter. Some AAC-1s had small trim tabs mounted on the rudder. A few *Armée de l'Air* aircraft had the starboard cargo door modified to open to both sides and not vertically as on most Toucans.

AAC-1s saw extensive service against Viet Minh forces in French Indochina (now Vietnam, Laos, and Cambodia), including a drop of paratroopers to the encircled city of Nam Dinh in January of 1947. Similar operations were flown over Hoah Bin, Cho Bo, and Moc Han. Several AAC-1s were locally modified to carry sixteen 50 kg (110.2 pound) bombs under the wings and fuselage, which were aimed using a Type D-30 bombsight. Several Toucans were also armed with machine guns. The French withdrew their last AAC-1s – nicknamed 'Julie' by their crews – from Indochina in 1952.

AAC-1s also saw service during a riot against the French in Madagascar in March of 1947 and a few Toucans flew in the Berlin Airlift in 1948-49. The *Armée de l'Air* and the *Aéronavale* (French Naval Aviation) withdrew the last AAC-1s from service in 1960. Air France flew 45 Toucans on scheduled services in the post-World War Two period. AAC-1s also flew with the Czechoslovak airline CSA, the Bata Shoe Company at Zlin, Czechoslovakia, and the Portuguese and Yugoslavian air forces.

This AAC-1 (6320) was one of 13 ex-French Air Force Toucans transferred to the Portuguese Air Force in December of 1960. This aircraft included the second fuselage radio antenna mast that was standard on French-built Ju 52/3ms. The Portuguese aircraft has a white upper fuselage, while the rest of the airframe is natural metal. (via Rui Ferreira)

An AAC-1 Toucan (s/n 115) is moments from landing at Persan Beaumont airfield in France, with the flaps fully lowered at 40°. Most Toucans had a three-piece vertically opened cargo door; however, this particular aircraft's cargo door opened to both sides. A second antenna mast was mounted atop the mid-fuselage. French AAC-1s were left in overall natural metal. (SHAA)

A water buffalo brings supplies to an AAC-1 (s/n 164) at Nasan airfield in French Indochina (now Vietnam) in 1950. This aircraft has the standard three-piece cargo door. The French deployed Toucans on transport and bombing missions against the Viet Minh forces. AAC-1s served in French Indochina until 1952. (SHAA)



# CASA 352

In 1944, Germany granted a Ju 52/3m g7e manufacturing license to Spain's *Construcciones Aeronáuticas SA* (CASA). License production began at CASA's Madrid plant the next year, under the designation **CASA 352**. The first aircraft left the production line in June of 1945 and early machines were assigned to the *Regimiento Mixto No. 1* (1st Mixed Regiment), *Ejército del Aire Español* (Spanish Air Force) at Alcala de Henares, near Madrid.

The 106 CASA 352s built were powered by Spanish copies of the Soviet M-25A radial engine, which also powered the Polikarpov I-15 and I-16 fighters. This 583 HP powerplant was, in turn, a Soviet copy of the American Wright SGR-1820 F-3 Cyclone engine. The CASA 352s were similar to Ju 52/3m g7es, apart from a slightly enlarged NACA cowling on the center engine.

CASA followed their 352 with the improved **CASA 352 L**, which was powered by 673 HP ENMASA B3 engines. The powerplants were manufactured by *Empresa Nacional de Motores de Aviacion SA* (State Enterprise for Aviation Engines Limited) in Barcelona. The B3 required a larger NACA cowling, with an inlet mounted atop this cowling. The center engine exhaust stubs were increased over those fitted to the previous CASA 352. The wing engine exhausts were lengthened on the CASA 352 L, with the stub ending on the upper rear cowling lip. Three tube-shaped oil coolers were mounted in a triangular format on each engine cowling undersurface. Front air intake louvers were removed from the engines. A teardrop-shaped radio compass antenna replaced the loop antenna atop the fuselage.

CASA built 64 CASA 352Ls from 1945 until 1954, bringing the total of CASA-built Ju 52/3ms to 170. These aircraft were only delivered to the *Ejército del Aire* in three subvariants: the **A-1** for paratroops and cargo; **A-3** passenger transport; and, **C** for training. The *Ejército del Aire* designated the CASA 352/352L as the **T.2B**.

In February of 1958, T.2Bs were committed to the aerial resupply of besieged Spanish forces in Ifni, located in the Western Sahara. The rebels cut off communications among the Spanish strong points in an effort to force Spain out of North Africa. The T.2Bs based at Gando on Las Palmas, Canary Islands dropped paratroops and supplies to the isolated positions in Ifni. Several aircraft were hastily converted to bombers for attacking the rebel forces. This marked the final combat service of the Ju 52/3m. Spain left Ifni in 1969 and the territory became part of Morocco.

The *Ejército del Aire* began withdrawing the CASA 352 from service in 1965, with the last aircraft retired in 1978. Several 471 Squadron aircraft were painted in Luftwaffe markings for the 1969 motion picture "Battle of Britain." Today, 22 CASA 352s exist either as museum exhibits or in flying condition. One example is a CASA 352L (s/n 067) which is flown by the Commemorative Air Force (formerly Confederate Air Force) in the United States and marked as Luftwaffe aircraft 1Z+AR. Switzerland's Ju-Air Company rebuilt a CASA 352L (s/n 096) with original BMW 132 engines for sightseeing flights. Another CASA 352L (s/n 58, C-GARM) was rebuilt as a single-engined Ju 52 and is currently displayed at the Western Canadian Aviation Museum in Winnipeg, Manitoba.



A CASA 352L (781-50) is parked at a Spanish Air Force field between missions. The Air Force designated this aircraft the T.2B. The serial T.2B-177 was painted on the vertical stabilizer of one of the last CASA 352s built. A football-shaped Automatic Direction Finder (ADF) antenna is mounted atop the forward fuselage beside the antenna mast. (Juan Arraez via Harold Thiele)

This CASA 352L (36-3) crashed in the Spanish Sahara desert after the starboard main wheel broke away on landing. This wheel and part of its strut rest in the foreground. Spanish-built Ju 52/3ms had longer NACA cowlings on all three engines and featured longer exhaust stacks on the center engine. (Harold Thiele)







Short Brothers converted this ex-Luftwaffe Ju 52/3m g8e into an airliner for British European Airways (BEA), which registered it as G-AHOF. The airline's Speedkey insignia is painted on the vertical stabilizer. BEA flew this aircraft on domestic routes between 29 November 1946 and 25 September 1947. This Ju 52/3m was scrapped at Warrington in February of 1948. (Royal Air Force Museum)

This float-equipped Ju 52/3m ge (LN-KAF, Werk Nr. 5489) was flown by Norway's *Det Norske Luftfartsselskap* (DNL) airline shortly after World War Two. The aircraft flew on domestic routes until October of 1956. (Lufthansa)



## Ju 52/3m in Postwar Civil Service

In 1947, British European Airways (BEA) contracted with Short Brothers in Belfast, Northern Ireland to convert 11 ex-Luftwaffe Ju 52/3ms into 12-passenger airliners. Shorts installed a teardrop-shaped radio compass antenna atop the fuselage, immediately aft of the cockpit. A tall radio antenna mast was placed atop the forward fuselage, while a smaller mast was installed immediately aft of the port rear door. Additionally, the large two-piece port cargo door was removed and a panel of corrugated skin faired over this opening. The 11 converted Ju 52/3ms were allocated to BEA, with civil registrations G-AHBP and G-AHOC to G-AHOL. The airline flew the Junkers transports on services to the British Isles, beginning with a flight from London-Croydon to Belfast-Sydenham on 18 November 1947. The Ju 52/3m remained in BEA service until its last scheduled flight on 31 August 1948.

Scandinavian Airlines System (SAS) operated Ju 52/3m floatplanes until the summer of 1956. The Norwegian airline *Det Norske Luftfartsselskap* (DNL) also flew Ju 52/3m floatplanes in the post-war period. In Bulgaria, three former BVV (Bulgarian Air Force) Ju 52/3ms were the first aircraft assigned to *Bulgarski Vusdushni Linii* (BVL; Bulgarian Airlines). Nikola Alexandrov flew the airline's inaugural Ju 52/3m flight from Vrazhdebna to Bourgas on 29 June 1949. Bulgarian Prime Minister Georgi Dimitrov was among the passengers on this flight.

The Soviet state airline *Aeroflot* began flying captured Ju 52/3ms on the Perm to Kuybyshev (now Samara) route in the summer of 1944. *Aeroflot* used these aircraft to fly sulfur from mines in Central Asia to Soviet factories. The Soviets retrofitted several Ju 52/3ms with Soviet RPK-10 radio compasses. These aircraft remained in *Aeroflot* service until the 1950s. After Romania defected from the Axis in August of 1944, state airline LARES flew Ju 52/3ms. One was used to fly Romanian delegates from Bucharest to Odessa, the Ukraine for Armistice talks with the Soviet Union. LARES operated three Ju 52/3ms on domestic service from 1946 until 1947.

In 1955, Gibbes Sepik Airways purchased three Ju 52/3ms from the Swedish firm M. Ahrenberg for operation in Papua New Guinea, then an Australian protectorate. Wing Commander Robert H.W. 'Bobby' Gibbes, the company's founder and a World War Two air ace, flew the first of these aircraft (Werk Nr. 7256, VH-BUU) from Bromma, Sweden to Goroka, Papua New Guinea in October of 1955. The other two Ju 52/3ms (Werk Nr. 7493, VH-BUV and Werk Nr. 641375, VH-BUW) were ferried to Papua New Guinea in January of 1957. Gibbes Sepik had additional fuel tanks installed for the ferry flight, which allowed for ten hours of flight.

After the Ju 52/3ms arrived in Papua New Guinea, Gibbes Sepik replaced the BMW 132 radial engines with Australian-built 600 HP Pratt & Whitney R-1340-SH-G radial engines. These powerplants were originally built for CAC Wirraway trainers during World War Two. Three-bladed Hamilton Standard 3-D40 variable-pitch metal propellers were also fitted to Gibbes Sepik's Ju 52/3ms.

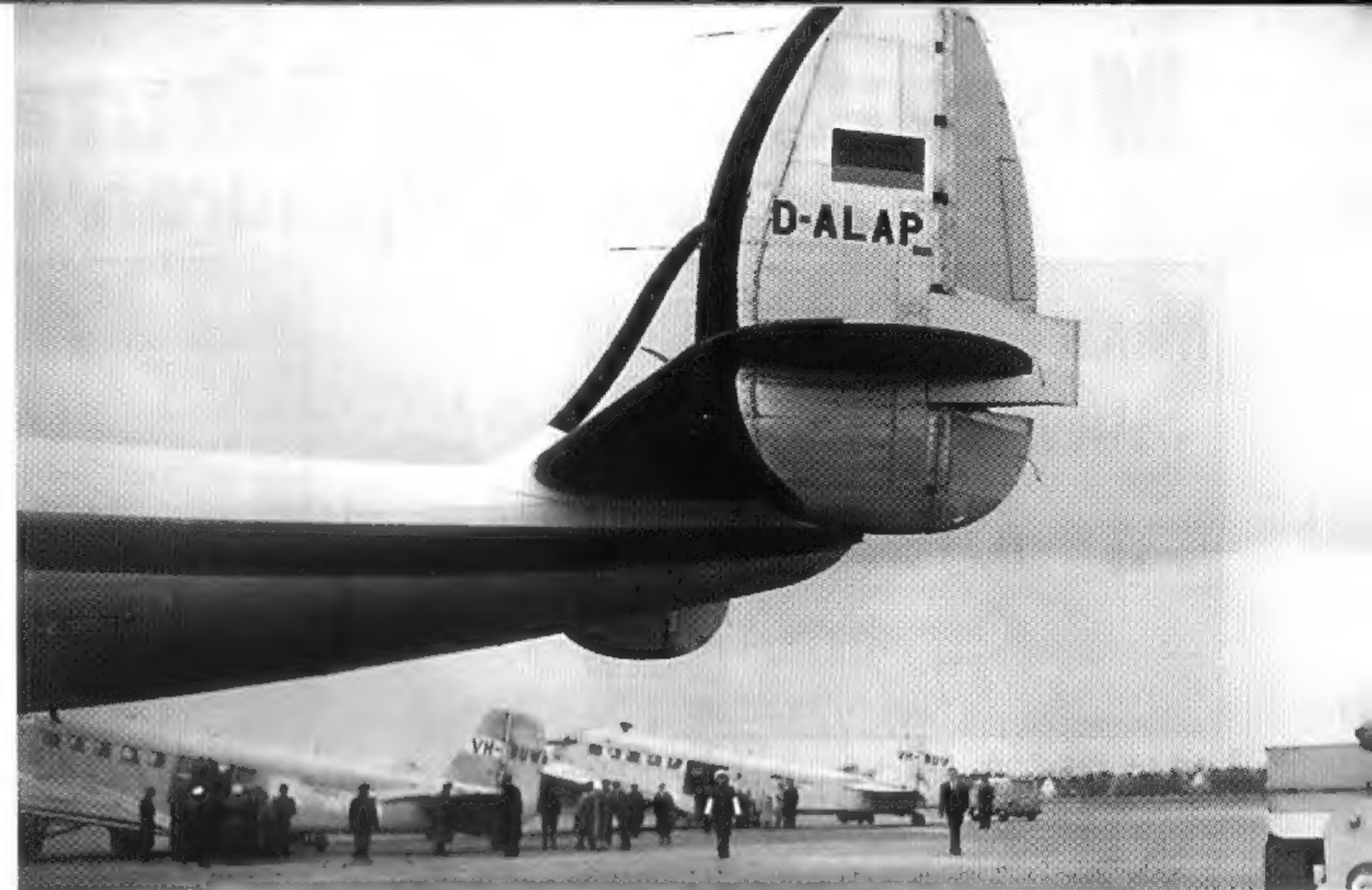
Gibbes Sepik's Ju 52/3ms were ideal for operating off the short and rough airstrips in Papua New Guinea that were unsuitable to the Douglas DC-3. The airline flew passengers and cargo within New Guinea and between the island and Australia. Their first Ju 52/3m (VH-BUU) was written off after an emergency landing at Baiyer River on 17 October 1959. The two surviving Junkers transports remained in service until April of 1960, when they were scrapped at Madang, New Guinea.





An Aeroflot Ju 52/3m g4e (SSSR-L64) is loaded with sulfur at Askkhabad, Turkmenistan in 1947. The airline's name in Cyrillic lettering is painted on the nose. The Soviets captured several Ju 52/3ms on the Russian Front during World War Two, pressing them into both military and civil service. Aeroflot's Ju 52/3ms remained in service well into the 1950s. (Victor Kullkov)

The Bata Shoe Company flew this AAC-1 Toucan (OK-ZBB, s/n 111) for passenger flights from its Zlin, Czechoslovakia headquarters from 1945 until 1946. The wing roundel of its previous French operator was painted over in silver. Bata also operated a cargo-configured Toucan (OK-ZBC, s/n 153) at Zlin. The firm flew that aircraft from 1945 until it was sold to France on 17 March 1951. (The Thomas Bata Foundation)



Two Ju 52/3ms (VH-BUW, front, and VH-BUV) for Gibbes Sepik Airways are parked at Hamburg-Fuhlsbüttel airport in late January of 1957. The Papua New Guinea-based Gibbes Sepik purchased three Ju 52/3ms from Sweden in 1955. The airline flew the aircraft on cargo missions in Papua New Guinea until April of 1960. The three Ju 52/3ms were scrapped two years later and the metal sold to Japan. The tail of a Lufthansa Lockheed Super Constellation (D-ALAP) is in the foreground. (Lufthansa)

Bulgarian troops captured this Ju 52/3m g7e (LZ-UNO) from German forces late in World War Two. It served with the Bulgarian Air Force on transport duties before its reassignment to BVL (Bulgarian Airlines) in the summer of 1949. The airline flew three Ju 52/3ms on domestic routes until the early 1950s. The rudder is painted in the Bulgarian colors of (from top) white, green, and red. (Stephan Boshniakov)







(Above) A Ju 52/3m g7e (7V+NK) assigned to *Kampfgruppe* (Bomber Group) 500 flies over the Eastern Front during the winter of 1942-43. This aircraft was among many Ju 52/3ms and other Luftwaffe aircraft deployed to the Stalingrad sector during the unsuccessful airlift to the encircled German Sixth Army.

(Below) This Ju 52/3m MS flies low over the Danube River in Hungary during the summer of 1944. *Minensuchgruppe* (Mine Search Group) 1 deployed six Ju 52/3m MSs to Hungary the previous April after British aircraft began dropping magnetic mines into the Danube.

